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ABSTRACT

The report describes second-year project activities of the Early Intervention Research Institute (EIRI) at Utah State University, relating to a 5-year project to conduct 16 longitudinal studies of the effects and costs of alternative types of early intervention with handicapped children. Six of the studies are to investigate effects of varying the intensity of the intervention program, five to investigate variations in age at onset of intervention, and five to investigate effects of program variation. The report first describes the refinement and revision of methodology and procedures for conducting the longitudinal studies, focusing on instrumentation, treatment verification, randomization of subjects, economic evaluation procedures, and on-site evaluations. Detailed descriptions of each of the 16 selected research sites provide such information as rationale for the particular study conducted at that site, subject recruitment and assignment procedures, alternative types of intervention programs to be compared in that site, data collection and analysis activities, and procedures to verify implementation of intended treatment. Development and pilot testing of a four-part data collection protocol called the Early Intervention Program Inventory (EIPI), designed to collect descriptive data on program and client characteristics, is then discussed. Advisory committee activities are summarized in a final chapter, followed by a reference section and four appendices including materials related to EIRI dissemination activities, instrumentation procedures, the EIPI, and on-site evaluations. (JW)

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1986-87 ANNUAL REPORT

of the

LONGITUDINAL STUDIES OF THE EFFECTS AND COSTS OF EARLY INTERVENTION FOR HANDICAPPED CHILDREN

Submitted to the
U. S. Department of Education

by the

EARLY INTERVENTION RESEARCH INSTITUTE

Karl R. White, Director
(801) 750-2003

Utah State University

September 1, 1987

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PREFACE

The following document contains the annual report of the **Longitudinal Studies of the Effects and Costs of Early Intervention with Handicapped Children.** This study is being conducted by the Early Intervention Research Institute at Utah State University as a part of a contract with the United States Department of Education, with additional funding being provided by the National Institute of Child Health and Human Development and the Division of Maternal and Child Health of the Public Health Service. The study was initiated in the Fall of 1985, and the first subjects were enrolled in the longitudinal phase of the study in October of 1986. The study is designed to be continued at least through the Fall of 1990, with the exception that another contract will be competitively awarded at that time to continue data collection efforts for an additional five years.

The contract with the Department of Education required a final draft of the annual report to be submitted by September 1 of each year. Because the majority of outcome data are collected in the early summer of each year, the timeline for report submission means that much of the outcome data for the year cannot be collected, checked for accuracy, prepared for analyses, and included in that year's annual report. More up-to-date information on any one of the 16 studies reported in this volume will be available from the Early Intervention Research Institute upon request by October 1 of each year. Interested parties may contact the institute directly to obtain such information.

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I. INTRODUCTION

In the fall of 1985 the U. S. Department of Education undertook a significant new initiative to investigate the longitudinal effects and costs of providing alternative types of early intervention services to handicapped children. Through a competitively awarded contract to the Early Intervention Research Institute at Utah State University, planning was undertaken for 16 separate longitudinal studies of early intervention efficacy. The impetus for this type of a large scale research project stems from at least three sources, as described below.

First, over the past 25 years, hundreds of research studies have been conducted to investigate the efficacy of early intervention programs with handicapped, disadvantaged, and at-risk children. Unfortunately, much of this research has suffered from serious methodological flaws, narrow definition of outcome, and/or inadequately implemented interventions (Dunst & Rheingrover, 1981; Simeonsson, Coopyer, & Scheiner, 1982). Most of the research which has been well done, has been done with disadvantaged children and there are questions about the degree to which findings from research with such children will be applicable to handicapped children (White & Casto, 1985). Consequently, there is very little credible research data which can be used to draw conclusions about what types of early intervention programs are best for which subgroups of handicapped children.

Second, during the last 10 years there has been a dramatic increase in the availability of early intervention programs for handicapped children. This expansion is expected to continue and even increase. Although much progress has been made, it is evident that the lack of high-quality research with handicapped children has been a substantial impediment to improving the quality of early intervention services to handicapped children. Furthermore, the rapid and continuing expansion has increased the need for better information about which early intervention programs are best for which children.

Third, during the last decade resources for providing human service programs have become increasingly limited. This has led policy makers and program administrators to be more concerned about the costs as well as the effects of all human service programs. With regard to early intervention there have been increasingly frequent questions about which types of programs are most cost-effective. Unfortunately, almost none of the existing early intervention research has included a cost analysis component.

It was in light of these three factors (limited high-quality early intervention research with handicapped children, pressures to expand early intervention programs for handicapped children, and the almost total absence of efficacy research which includes a cost-analysis component), that the U. S. Department of Education issued a Request for Proposals (RFP) in the spring of 1985. This RFP called for a contractor who would conduct a series of 16 experimental studies investigating the effects and costs of alternative types of early intervention with handicapped children. The RFP stipulated that each of those studies must be a randomized experiment in which two alternative types of intervention were compared, must consider the effects of the intervention for both children and families, must analyze the costs in conjunction with the effects of the alternative types of intervention, and must be carried out in field-based settings which were representative of current practice in state-of-the-art early intervention programs.

The RFP required that six of the studies would investigate the effects of varying the intensity of the intervention program, five would investigate variations in the age at which the comprehensive intervention program began, and five would investigate the effects of program variation. These studies were to be done with various subgroups of handicapped children (e.g., visually impaired, hearing impaired, severely handicapped, etc.) instead of with disadvantaged or at-risk children. The contract provided funding for a 5-year period so that the effects of intervention could be assessed longitudinally, but the money was limited to actually conducting the research and could not be used to fund the intervention programs.

As a separate part of the contract, the recipient was also required to develop a system which could be used to describe the participating children, nature of the intervention program, costs, and effects of a series of early intervention programs for handicapped children. This system was to be designed in such a way that it could be used on a regional, state, or national basis to describe a series of intervention programs. The intent of this data collection system was that it could be used by administrators of a number of programs (e.g., a state coordinator of preschool programs to systematically and objectively describe the type of programs being offered, identify gaps in the existing system, and draw conclusions about which programs were best for a particular purpose.

The contractor was to conduct a series of feasibility studies during the first year (1985-86), after which the Government would decide whether it wanted to proceed with all or parts of the proposed research workscope. A decision to proceed would be made by exercising one or more of the contract "options". Option 1 was the series of six studies investigating the effects of varying the intensity of intervention. Option 2 included the five studies designed to investigate the effects of varying the age at which early intervention began. Option 3 consisted of the five studies designed to investigate the effects of program variation. Finally, Option 4 included the development and testing of the procedures and protocols for a system for describing early intervention programs.

Based on the work done during that first year, (1985-86), the Government decided to exercise all four options of the contract. As a result of their exercising all four contract options, the actual work of the **Longitudinal Studies of the Effects and Costs of Early Intervention with Handicapped Children** was initiated in October of 1986 and will extend through September 30, 1990. Depending on the results of the project to that point in time, federal officials have announced a tentative plan to fund another 5-year contract which will continue to collect data so that the long-term effects of early intervention with handicapped children can be assessed.

The purpose of this report is to summarize the current status of the **Longitudinal Studies of the Effects and Costs of Early Intervention with Handicapped Children**, describe the accomplishments during the second year of the project (1986-87), and describe the plans for the third year. The remainder of this introductory section will summarize, by way of review, the activities and accomplishments during the first year of the project (1985-86), and outline the workscope of the second year of the project so that the reader can understand how the components in the remainder of the report are related to each other.

Accomplishments During 1985-86

The primary task during the first year of the project was to identify the sites that would participate in the 16 longitudinal studies. This task was made more difficult by the constraints imposed by the original RFP. For example, since the contract funds could not be used to actually provide services, service programs had to be identified who were willing and able to contribute financial resources (often substantial amounts) to conducting the expanded services necessary for the comparative experiments. In addition, potential collaborators had to be willing to abide by the conditions of the contract (random assignment of children to groups, extensive data collection on both children, families and program costs, and provision of data necessary to verify treatment implementation). Finally the type of research called for in the RFP eliminated many potential collaborators because of the necessity of having fairly large groups of handicapped children who were available for participation in the experimental groups.

The foregoing requirements necessitated a nationwide search for projects who were interested in collaborating in the longitudinal research. Over 50 programs were contacted and almost 25 were site visited during the recruitment phase of the project. Using carefully developed criteria in a number of areas, EIRI staff narrowed the potential participants until the final set of 16 had been identified.

Another major activity during the first year was the development, pilot testing, revision, and finalization of the various procedures and protocols necessary to implement the 16 studies. For example, from among the hundreds of measures available for measuring child and family progress, EIRI staff had to select those measures which appeared to be most appropriate for these particular studies of early intervention. Procedures also had to be developed for randomly assigning children to groups, conducting the cost-analyses, and collecting data on treatment verification. In some cases, the sites identified as collaborators needed assistance in enhancing various aspects of their program so that the research could be conducted. For example, staff worked with some programs in developing better child-find procedures, record keeping systems, inservice training protocols, and child assessment and evaluation techniques.

Based on the work referred to above, a series of four feasibility studies were initiated during the 1985-86 year. Three of these studies were carried out in conjunction with a special funding initiative in the state of Illinois, and one was conducted in Salt Lake City Utah. Each of these studies utilized the various procedures, data collection protocols, and management techniques that were being developed for the larger set of 16 studies. The purpose of these feasibility studies was to collect data that would assist the government in deciding whether it was feasible to conduct the series of 16 longitudinal studies called for in the original RFP. The feasibility studies were completed during this first year and yielded valuable information which led to revisions of several protocols and to rethinking of some of the management strategies being considered for the larger set of 16 studies. For example, the feasibility studies made it clear that the degree of training and monitoring that would be necessary for diagnosticians to appropriately use the Battelle Developmental Inventory, would have to be substantially greater than had first been anticipated. The feasibility studies also suggested that additional work would have to be devoted to identifying instruments appropriate for assessing motor development in very young children and for assessing the very small changes often exhibited by severely handicapped children. In many other areas, the feasibility studies yielded valuable insights which had a substantial impact on how the 16 longitudinal studies were eventually structured.

A fourth major activity of the first year was to raise additional money that could be used to enhance various aspects of the research. From the beginning it had been clear that the money available from the U.S. Department of Education would only allow a "bare bones" research project to be conducted. Particularly concerning was the limited amount of funds available for collecting outcome data for children and families, and the lack of funds available for "buying out" a portion of time of some of the staff at each of the collaborating research sites that would allow them to devote the necessary time and effort to the liaison activities necessary in this type of research.

During the first year (1985/86) EIRI staff devoted substantial amounts of time and effort to raising additional funds. Hundreds of private foundations were contacted, the Utah State Legislature was approached, and work was initiated with several other federal funding agencies. As a result of these efforts an ongoing $50,000 per year appropriation was received from the Utah State Legislature, a number of small donations were obtained from private companies and foundations, and a commitment was obtained from the National Institute of Child Health and Human Development for a substantial contribution for the project. The money obtained or committed dramatically increased the amount of data that could be collected as a part of the research and will enhance the interpretability of those data because of the expanded treatment verification and site liaison activities.

By the end of 1985-86 the United States Department of Education had decided to exercise all four options of the original contract and to proceed with the longitudinal studies of the effects and costs of early intervention. This set the stage for the 16 research studies to be implemented in October of 1986.

Workscope During Year 2 (1986-87)

As noted above, the contract with the U.S. Department of Education required the conduct of 16 studies of the longitudinal effects and costs of early intervention with handicapped children. These studies were designed to answer three types of questions (i.e., questions about intensity, age at start, and program variation), utilizing different types of handicapped children. Although the contract did not call for the studies to begin until October 1, 1986 when the second year of the contract actually began, it was necessary to begin several of the studies prior to that time because of the service year calender of several of the collaborators. In other words, for some of the collaborators, the service year began in August or September and in order to have children randomly assigned to groups, it was necessary to begin the experiment at the beginning of their service year as opposed to part way into it.

From the beginning it was clear that the continuation of any one of the 16 studies for the full time period of the contract would be dependent on a number of factors which were not under the control of EIRI or the service provider. For example, a number of the programs depended on state appropriated money for both their basic program and the expanded program necessary to do the research comparisons. If the state were to experience a financial crisis and cut funding for the program, the research project would be jeopardized. In other cases, the recruitment of subjects did not proceed as smoothly as projected and the success of the project was called into question (e.g., in those studies where low birthweight babies with intraventricular hemorrhaging, or where new handicapped children are being identified, it is not unusual for recruitment to vary dramatically over time). Because the successful implementation of any given study was in part dependent on factors which we could not control, we have continued to recruit additional sites and to maintain several alternative research sites. By doing this, the probability is increased that the requisite 16 number of studies called for in the contract will be completed.

Table I.1 shows the 16 studies currently included along with two alternate sites in which subjects have been enrolled. As can be seen in this table, several of the sites have been late in getting started, but all of them have been initiated and we anticipate having 16 successful studies.

During the second year of the study (1986-87) the following major activities have occurred.

- Study Implementation. As noted above, each of the 16 studies and several alternates have been implemented. These have been several changes from those studies reported in the baseline report. For example, based on much lower than estimated recruitment, we decided to only conduct one study instead of the two originally planned, in conjunction with Louisiana State University for children with intraventricular hemorrhage. The second, LSU/IVH study was replaced with a similar population of children in the Salt Lake City area. For similar reasons, the Alabama Institute for the Deaf and Blind Visually Impaired study, and the Citizens for the Disabled study have either been dropped or reclassified as an alternate study based on much lower enrollment of subjects than anticipated. These two studies have been replaced by studies at Phoenix Children's Hospital, which are investigating intensity and age at start issues with children who havesuffered traumatic brain injury. Finally, the New York study was changed to a pilot study during this first year because of logistical difficulties experienced by the site in developing the necessary curricula and programmatic procedures necessary for implementing the expanded program.

- Refine Procedures. The basic procedures for conducting the studies were developed during the initial year of the project. However, based on the results of that feasibility year, it was evident that several areas needed further work, particularly the procedures for recruiting, training, and monitoring diagnosticians, treatment verification; and cost-data collection. Work in these areas has proceeded simultaneously with the implementation of the studies.

- Recruitment of Additional Sites. As discussed above, there has been a need to replace several of the research sites identified in the baseline report. In addition, there is always a possibility that one of the existing sites will experience difficulties and have to be dropped. Hence, we have devoted substantial efforts to continue to identify and recruit potential collaborators. The two sites at Phoenix Children's Hospital, the Salt Lake City IVH site, and the alternate site in Reno were added this year as a function of those ongoing recruitment efforts. As the study proceeds, it is anticipated that such efforts will be reduced, but it seems wise to continue to be receptive to the possibility of particularly appropriate new sites.

- Finalize Arrangements for Additional Resources. During the 1985/86 preliminary approval was obtained from the National Institute of Child Health and Human Development for supplementing the Department of Education contract. However, substantial additional work was necessary to finalize those arrangements. Negotiations were initiated with the Division of Maternal and Child Health of the Public Health Service during 1986/87, and they agreed to supplement the existing contract. Arrangements were finalized for the NICHD money in April of 1987, and for the MCH money in July of 1987. As noted above, these additional resources will substantially enhance the benefits and interpretability of this research.

Table I.1

EARLY INTERVENTION RESEARCH INSTITUTE

LONGITUDINAL STUDIES

SITE	TYPE OF HANDICAP	AGE AT ENROLLMENT	DATE ENROLLMENT BEGAN	CURRENT SAMPLE SIZE	FINAL ESTIMATED SAMPLE SIZE	DATE SAMPLE EXPECTED TO BE COMPLETED
INTENSITY OF INTERVENTION						
(1) LSU IVH	Grade III and IV IVH	birth	2/87	14	40	1/88
(2) LSU Visually Impaired	Visually Impaired	0-2	2/87	20	50	1/88
(3) Alabama Hearing Impaired	Hearing Impaired	1-4	7/87	29	50	10/87
(4) Arkansas Sunshine Preschool	Mildly to Severely Handicapped	1-4	10/86	62	80	10/87
(5) SMA/Lake-McHenry	Severely Handicapped	0-3	1/86	70	70	6/87
(6) Phoenix Children's Hospital	Trauma Victims	1-3	5/87	4	60	12/88
AGE-AT-START						
(7) Salt Lake City IVH	Grades I, II, III & IV IVH	birth	2/86	45	60	1/88
(8) Wabash & Ohio	Mildly to Severely Handicapped	0-3	2/86	56	60	10/87
(9) South Carolina IVH	Grades I, II, III & IV IVH	birth	2/86	36	50	1/88
(10) Indiana School for the Deaf	Hearing Impaired	1-2	5/87	5	40	1/88
(11) Phoenix Children's Hospital	Trauma Victims	1-3	5/87	4	60	12/88
PROGRAM VARIATION						
(12) New Orleans ARC	Severely Handicapped	0-3	8/86	46	86	10/87
(13) Des Moines Public Schools	Mildly to Severely Handicapped	3-5	10/86	57	81	9/87
(14) Developmental Disabilities Incorporated (SLC)	Moderately to Severely Handicapped	3-5	1/87	56	56	6/87
(15) Association for Children with Down Syndrome (NY)	Down Syndrome	1-5	2/87	24	70	9/87
(16) Arkansas School for the Deaf	Hearing Impaired	2-5	8/86	31	50	12/87
ALTERNATE SITES						
(17) Citizens for the Disabled	Mildly to Severely Handicapped	0-3	2/86	22	22	6/87
(18) University of Nevada -- Reno	Behaviorally Disordered	3-4	4/87	44	44	6/87

- Dissemination Information. An important part of the institutes workscope is to disseminate information to professionals, parents, policymakers, and administrators. During the first year, such information dissemination was limited because the research had not yet been initiated. Results from the studies have still not been obtained, of course, but institute staff have become increasingly active in presenting information to conferences and publishing articles resulting from the work done thus far. This information focuses primarily on methodological, conceptual, and theoretical issues as discussed later (see Appendix 1).

- Training of Graduate Students. A part of the workscope dictated in the RFP was the provision of training to graduate students. During the past year, 19 graduate students and one post doctoral fellow have been employed by the institute. These individuals have participated in all aspects of the work described in the remainder of this report commensurate with their skills and experiences. Senior staff members at the institute view the mentoring responsibilities associated with having graduate students as an important part of their work and spend significant amounts of time in activities related to this role (see Appendix 1).

The remainder of this report summarizes the current status and accomplishments thus far during the 1986/87 year of the **Longitudinal Studies of the Effects and Costs of Early Intervention With Handicapped Children.** The report is organized as follows: the first section provides a summary of various methodological issues that have been particularly important to this years work (instrumentation, treatment verification, randomization procedures, cost-analyses, and on-site evaluations). The next section provides a detailed description of each of the 16 sites and two alternate sites which are currently participating in the research studies. This description provides a rationale for each of the studies, describes the participating subjects, summarizes the alternative interventions being investigated in the experimental comparisons, describes the specific treatment verification activities, delineates the assessment procedures, and outlines the data analysis activities (because posttest data were not collected until June and July in most cases, only a few projects have complete data analyses to report at this time). Following the descriptions of each of the sites, the current status of the workscope component to develop a data collection and program description is summarized. This work, referred to hereafter as the Early Intervention Program Inventory (EIPI), is scheduled for completion during the third year of the project, (1987-88). Finally, the results of the annual advisory committee meeting held in January of 1987 are summarized.

II. REFINEMENT OF METHODOLOGY AND PROCEDURES

As a result of the feasibility studies conducted during the 1985-86 year, and in response to the recommendations of the Advisory Committee at the January, 1987, meeting, the EIRI staff have continued to refine and revise procedures and protocols for conducting the longitudinal research. Prior to describing the specific studies included as a part of the longitudinal research, it is important to comment on five such areas (i.e., instrumentation, treatment verification, randomization of subjects, economic evaluation procedures, and onsite evaluations). Since these procedures are common to each of the research studies, an understanding of what has been done in each of those areas prior to the presentation of the specific studies will provide an organizational framework for understanding the details of each study, as well as efficiently presenting the information.

INSTRUMENTATION

As indicated in the base period report submitted in July, 1986, a number of activities occurred during the base period year in order to identify appropriate measures to be utilized in the studies. These activities included literature reviews, solicitation of input from experts in the field of early childhood assessment, and collection of data on promising instruments. These activities resulted in the selection of one child outcome measure and five family outcome measures which constitute the core assessment battery for the 16 studies. During the first year of the longitudinal phase of the studies, pretest data were collected in each of the studies, and posttest data were collected in those studies in which children had been enrolled for at least one year. This section of the report will describe the specific procedures utilized during pretesting and posttesting during the past year, as well as plans for posttesting during subsequent years.

Pretesting

Description of measures. The core pretest battery consists of the Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidubaldi, & Svinicki, 1984), Parenting Stress Index (Abidin, 1983), Family Resource Scale (Leet & Dunst, 1985), Family Support Scale (Dunst, Jenkins, & Trivette, 1984), Family Adaptability and Cohesion Evaluation Scales (FACES III) (Olson, Portner, & Lavee, 1985), and Family Inventory of Life Events and Changes (FILE) (McCubbin, Patterson, & Wilson, 1983). Each of these measures was selected to assess a different aspect of child and/or family functioning as follows:

Battelle Developmental Inventory (BDI). This is a standardized, individually administered assessment battery of key developmental skills in the following areas: Personal/Social, Adaptive, Motor (Fine and Gross), Communication (Expressive and Receptive) and Cognitive abilities. This measure was selected as a core child outcome measure due to the broad span of abilities tapped, a wide age range (birth through age 8), adaptations for handicapped children, and good psychometric characteristics.

Parenting Stress Index (PSI). The PSI assesses experienced stress in the parent-child system. Child-related factors include adaptability, acceptability, demandingness, mood, distractibility/hyperactivity, and reinforces parent. Parent factors include depression, attachment, restriction of role, sense of competence, social isolation, relationship to spouse, and parent health.

Family Resource Scale. This scale measures the extent to which different types of resources are adequate in households with young children. Factors include General Resources, Time Availability, Physical Resources, and External Support.

Family Support Scale. This scale assess the availability of sources of support, as well as the degree to which different sources of support have been helpful to families rearing young children.

FACES III. This scale provides a general picture of family functioning by assessing the family's level of adaptability and cohesion. The scale also has a perceived as well as an ideal form which provides an indication of the extent to which current family functioning is consistent with the family's expectations for ideal family functioning.

FILE. This scale assesses life events and changes experienced by a family unit during the past 12 months and prior to the past 12 months. The specific areas of potential strain covered by the scale include: Intra-family, Marital, Pregnancy and Childbearing, Finance and Business, Work-Family Transitions, Illness and Family "Care," Losses, Transitions "In and Out," and Legal.

Measures Administration. The BDI administration time ranges, depending upon the age of the child, from one to two hours. The full battery of family measures, including collection of demographic data, requires between one and two hours for parents who read at the fifth grade level or higher. Parents who have poor reading skills, or those with special characteristics (e.g., mental retardation), require more time because the measures must be administered in an interview format. Thus far, however, less than 2% of the parents have required an interview format for the administration of the family measures.

In general, the core measures selected have been feasible and cost-efficient to administer. Families have been cooperative in completing the pretest battery, which is quite positive given the possibility that for some parents it may be as long as four hours. Diagnosticians, assessment supervisors, and program staff who have observed the assessment process attribute much of this positive response to the availability of a nominal monetary incentive for parents.

The use of the BDI has been more difficult than expected, due to the need to train diagnosticians on this newly developed test. In using the BDI, it was also discovered that the DQ scores which can be derived from the tables in the manual are misleading. For example, some children can achieve scores in the negative range. In order to further examine the reasons for these problems with the DQ scores, EIRI staff met with Dr. Ken Hopkins from the University of Colorado at Boulder to discuss some of the problems that were being identified as well as to explore solutions to them. Dr. Hopkins suggested that the approach taken by the test developers in establishing the DQ scores was inappropriate. However, he did suggest that it would be appropriate to use raw score in our analyses, and we will do so.

Management of Pretesting

The management of pretest data collection was accomplished through the use of assessment supervisors and diagnosticians hired at each site. The responsibilities of the assessment coordinators included:

1. Familiarization with administration of the BDI.
2. Training and monitoring of Diagnosticians.
3. Scheduling testing.
4. Checking data and transmitting completed protocols to the EIRI site coordinator.
5. Reporting test results to parents who requested them.

Diagnosticians at each site were responsible for administration of the BDI and the family measures, although some responsibility for family measures administration was taken on by other personnel at some sites (as detailed in the site descriptions). As described in the next section, the training of diagnosticians on the BDI was necessary due to the unfamiliarity of most clinicians with this test.

Recruitment, Training, and Monitoring of Diagnosticians

Given the major role of the Battelle Developmental Inventory in measuring treatment outcomes, procedures were needed for recruitment, training, and monitoring of diagnosticians in order to ensure the quality of outcome data. Without such procedures, it is possible that data of questionable validity could be collected--thus jeopardizing all of the work of the longitudinal research. The following sections outline the procedures for recruiting, training, and monitoring the diagnosticians who will administer the outcome measures.

The assessment supervisor is instrumental in identifying candidates for diagnostician positions. Diagnosticians were recruited who have at least a bachelor's degree and some work towards a Masters, with course work and experience in individualized testing. Professionals with additional experience in working with handicapped children and/or children under five years of age received primary consideration.

Training. Training of the diagnosticians and the assessment supervisors is divided into three subsections: individualized pretraining, group training, and certification of performance. Individualized pretraining materials are mailed to the assessment supervisor approximately one month prior to the EIRI-conducted group training session. Each participant is required to study the Battelle Examiner's manual and briefly review the separate domain manuals. An introductory videotape depicting an overview of the purposes, organization, and administration techniques for the Battelle is also provided. Subsequent videotapes provide detailed information regarding preparation procedures for test administration and the administration of the Personal/Social Domain. Actual administration of items from the Battelle is depicted, including an example of scoring for selected items.

After viewing the videotapes, written exercises are to be completed. Due to the complexity of the scoring procedures for the BDI, pretraining activities have been designed to provide the trainees with an opportunity to get acquainted with the process. The trainee reads a detailed handout clarifying the scoring procedures and specific rules to be followed for EIRI research. A completed sample scoring booklet is provided, demonstrating the calculation of raw scores, age equivalents, and standard scores. The trainees are then directed to complete two of the five versions of the practice scoring booklets, calculating subdomain and domain raw scores as well as standard scores and age equivalents. Finally, a self-mastery test is to be completed, which assesses the trainee's mastery of standardized administration and scoring procedures, test organization, and test content. The trainees may refer to the manuals and handouts for assistance in answering the questions. The assessment supervisor in each area is responsible for making sure that trainees complete all of the training materials before participation in the group training. The assessment supervisor also completes the pretraining activities if he or she has not done so at a previous time. The EIRI assessment coordinator checks the paperwork, requiring 90% accuracy.

Group training is conducted by an EIRI staff member in one and one-half days at the research site. The length of the group training session has been increased considerably from the training prototype. Given the need for comprehensive training, a great deal of modeling, simulated practice, and immediate feedback on performance was deemed necessary. Therefore, our decision was to focus our efforts on more intensive, personalized training instead of developing more instructional videotapes. All diagnostician candidates and the assessment supervisors are required to attend the group training session.

The group training session begins with a brief overview of the Battelle Developmental Inventory, including our rationale for selecting it as our core measure, the importance of adhering to standard procedures, and concurrent validity findings. More sophisticated scoring procedures are reviewed, such as the utilization of extreme scores. Common mistakes and suggestions for preventing scoring errors are provided. The majority of the training session involves focusing on the five domains of the Battelle. Domain-specific administration procedures are emphasized by the trainer. Guided practice of actual item administration is conducted by dividing the participants into pairs. After practicing selected items, there is a group demonstration and feedback on performance is given. The trainees are also asked to determine item scores based on the observed performance. Finally, adaptations for various handicapping conditions are highlighted.

Following this practice, there is a 40-minute videotape which portrays the administration of certain items. The purpose of this exercise is to evaluate the trainee's ability to discriminate correct from incorrect administration and scoring procedures. During this administration, the diagnostician on the videotape does most things correctly, but allows a number of mistakes ranging in seriousness from minor to very major. A completed protocol accompanies this videotape. Trainees are asked to identify mistakes in administration or scoring that are made during the administration.

A group mastery paper and pencil test is administered at the conclusion of the Battelle training. This is a "closed book" test, containing items that require the trainees to recall pertinent factual information as well as apply the learned information. Ninety percent accuracy is required on this test before the trainee will be certified as an EIRI diagnostician.

In most cases the diagnosticians who have attended the Battelle testing session are the ones who administer the family measures. Though the diagnosticians do not score the measures or study the parent's responses, it is important that they are familiar with the surveys in order to check the forms for completion and answer any questions that the parents may have. Therefore, an overview of the administration procedures for the family measures is also provided at the group training session.

Data have been collected regarding the participants' satisfaction with the group training experience. Results show that the participants who have been trained this year, on the average, rated the content and the presenter as 4.5 on a 5-point scale (refer to Appendix II).

Following the group training session, each trainee completes three BDI practice administrations. At least one of the three practice tests must be administered to a child with a handicapping condition/developmental delay similar to those of subjectsin the study. The first administration is done independently, and the completed protocol is given to the assessment supervisor. Each trainee is then observed by the assessment supervisor, administering either a second full BDI or selected items appropriate for the child's developmental level. The assessment supervisor evaluates the trainee's adherence to standard administration procedures and scoring rules. Constructive feedback concerning the trainee's errors is given and strengths that the trainee demonstrates are reinforced. Eighty to 100% accuracy is required before the trainee will be certified as an EIRI tester. This demonstration must be repeated if the criterion is not met. The third performance exercise requires that the trainee be videotaped during the administration of a complete Battelle. This videotaped administration, accompanied by the corresponding protocol, is sent to the EIRI assessment coordinator. The administration is shadow scored, and interreliability is calculated. Agreement for scoring and equal .80 in order for the trainee to be certified as an EIRI diagnostician. Administration errors must be minimal. Trainees who successfully complete the training process must sign a promise of confidentiality prior to testing for EIRI. An outline summarizing these training procedures can be found in Appendix II.

Monitoring. In order to maintain accuracy in test administration, the diagnosticians are monitored closely by the assessment supervisor. Ten percent of each diagnostician's Battelle administrations are observed and shadow scored by the assessment supervisor or fellow diagnosticians and must result in 80% agreement and accuracy. Agreement between the EIRI assessment supervisor and the diagnosticians on these videotapes has ranged from 80% to 96% with a mean of 89%. Diagnosticians who test for the research project for several years will be required to submit a videotape of an administration to the EIRI assessment coordinator yearly, demonstrating that the tester is not drifting from standard administration procedures.

Posttesting

Description of Measures. The core assessment battery administered at pretest is administered again at posttest. In addition, at least three complementary measures are administered in each project. As indicated in the base period report, the complementary measures were selected to reflect specific differences expected in particular questions under investigation. However, an attempt was also made to administer the same complementary measures in studies which deal with similar populations of children. For example, an effort was made to use similar measures in each of the three studies of children with IVH. The specific complementary measures used in each study are listed in Table II.1.

A number of the measures listed in Table II.1 represent instruments or procedures which were developed by institute staff in areas where existing measures were inadequate. For example, there is no existing instrument for assessing the motor functioning of young children which will provide a detailed assessment of motor functioning in children from birth to age three. Existing instruments are either too narrow in age range, have poor psychometric properties, or require the clinical judgement of trained physical therapists to administer.

Three areas were targeted as requiring the development of additional assessment procedures: motor functioning of children below age 3, progress of severely handicapped students, and parent/child interaction. The development of these procedures is described in the next section.

Videotaped Assessment Procedures

Both researchers and practitioners have voiced a need for assessment procedures to assist in decision making for programming and to show the treatment gains of delayed preschool children. Standardized instruments may not be sensitive enough to measure small gains due to the gross gradation of developmental milestones. In addition, the content of the instruments may not correspond with the type of treatment received. Criterion-referenced measures, although generally more sensitive to small increments of change, are often subject to variability in administration due to lack of standardized administration procedures.

Table II.1

Complementary Measures Used in Various Sites for the EIRI Longitudinal Research

	PROJECTS																	
Name of Measure	LSU IVII	LSU VI	Alabama III	Arkansas Sunshine	SMA/Lake-McHenry	Phoenix Children's Hospital	SLC IVII	Wabash & Ohio	South Carolina IVII	Indiana School for the Deaf	Phoenix Children's Hospital	New Orleans ARC	Des Moines Public Schools	SLC - DDI	NY Down Syndrome	Arkansas School for the Deaf	Citizens for the Disabled	University of Nevada - Reno
Bayley Scales of Infant Development					X	X					X							
Parent/Child Interaction Videotape	X	X			X		X		X									
Child Improvement Questionnaire (Locus of Control)													X	X			X	
Achenbach Child Behavior Checklist																		X
Minnesota Child Development Inventory				X		X		X	X		X			X				
Temperament Scale (Carey)	X					X	X		X		X				X		X	
Parent Knowledge													X	X				X
Early Childhood Continuum of Assessment, Programming, Evaluation, & Resources (CAPER)														X				
Walker Problem Behavior Checklist																		X
Sequenced Inventory of Communication Development				X													X	X
Meadow-Kendall Social-Emotional Developmental Inventory for Deaf Students			X							X						X		
California Preschool Social Competency Scale																		X
Wisconsin Behavior Rating Scale					X													
Peabody Picture Vocabulary Test (administered to child)			X							X						X		
Grammatical Analysis of Elicited Language										X								
Peabody Mobility Scale		X																
Neuro-Developmental Assessment	X					X					X							
Movement Assessment of Infants	X																	
Early Intervention Developmental Profile												X						
Videotape of Attending, Interaction, & Exploration		X																
Videotape of Motor Functioning	X					X	X		X		X							
UPAS															X			
Reynell Developmental Language Scales																X		
Language Sample																X		
Videotape of Developmental Goals				X								X						
Parent as Teacher Video														X				
Maternal IQ (PPVT or Slosson)								P	S					P				
CES-D						X					X			X				
Neuro Psych Assessment						X					X							
Observation 15 min Time Sample 10 min Teacher Interaction																		X X
Preferential Looking		X																X
Attachment Measure							X											
Stanford-Binet						X												
Uzgiris-Hunt		X												X				
Interactive Communication Inventory											X							

In an effort to find more sensitive methods to assess intervention effectiveness in its longitudinal studies, EIRI is applying video technology combined with standardized observation procedures. There are several benefits in using videotapes as a method of recording subject's performance. First, a permanent record of the child's behavior results, and can be reviewed as many times as needed. Second, videotaping facilitates the collection of shadow scoring data, and precludes the presence of a second rater during the actual testing. Third, videotaping enables the evaluator to analyze behaviors using a variety of methods. Fourth, different variables or behavior characteristics can be considered. Finally, cross comparisons between a variety of assessmentmethods can be implemented, yielding useful correlation data.

Videotaped assessment procedures have been developed to assess treatment for three specific populations: (1) children with severe handicaps, (2) children primarily receiving motor intervention, and (3) families involved in treatments having a strong parent involvement component. Each of these procedures is described below.

Videotaped assessment of goal achievement for the severely handicapped. The use of norm-referenced and criterion-referenced assessment tools for severely handicapped children have been criticized for lack of sensitivity to the small increments of progress that are made by such children. It is also argued that these children may actually progress, but not in skills measured by most developmentally-based assessments. For example, programs that serve severely handicapped children are typically guided by functional goals that address daily living skills as opposed to goals that are guided by developmental milestones.

In order to accommodate the individualized progress made by severely/multiply handicapped children who are participating in the treatment intensity studies, a prototype for evaluating individualized educational program goals was devised.

This prototype is currently being implemented with children at the Arkansas

Sunshine Program and involves videotaping the performance of subjects shortly after treatment had begun and again at the end of the first year of treatment. A description of these procedures can be found in Appendix II. A scoring procedure for evaluating the videotapes is in the process of being developed. The resulting score will be a numerical rating of the degree of achievement that has been reached by each subject. Once a scoring procedure has been finalized, naive raters with expertise in serving severely handicapped children will be recruited to score the tapes. Scoring procedures will be piloted by October, 1987.

Videotaped assessment of motor functioning. Due to the emphasis on motor development with subjects involved in the IVH studies, assessment procedures that were sensitive to changes in motor behavior were needed. Standardized instruments such as the Peabody Motor Scales provide normative information based on the achievement of developmental motor milestones. However, physical and occupational therapists focus intervention on enhancing patterns of movement which are the components of these milestones. Although attempts are being made to develop standardized measures of early movement patterns, no tool is available for the longitudinal study of infants and young children. To address this need, a videotaped sequence of movement patterns has been developed. The standardized sequence is designed to analyze motor behaviors seen in children functioning up to a 12-15 month level. A script describing the exact procedures can be found in Appendix II.

Videotapes are being recorded on all subjects involved in the IVH research studies upon reaching an adjusted age of 12 months. Scoring procedures to analyze treatment differences between the early versus late groups as well as to determine individual subject changes are in the process of being developed. Motor therapists with experience in neurodevelopmental treatment who are naive to the research design will score the videotapes. Scoring procedures will be piloted by October, 1987.

Videotaped assessment of parent-child interaction. Recent awareness of the importance of parent-child interaction is influencing assessment and intervention practices. Increased parental involvement in intervention has prompted researchers to develop instruments to assess the interaction of handicapped children and their caregivers. Although adequate interrater reliability has been established for these instruments, the concurrent and predictive validity of the systems has not been documented.

A number of EIRI studies that have a major parental involvement component in their treatment groups are involved in assessing parent-child interaction (refer to Complementary Measures Summary Chart in Table II.1 for studies which are included). In order to evaluate the effects of the parent involvement treatment, a standardized procedure for videotaping has been developed which employs a specific sequence of structured and free play activities with a fixed set of materials (see Appendix 1). Researchers who have developed validated coding systems have agreed to be hired as consultants to analyze the videotaped interactions. There are several benefits in utilizing a variety of coding systems in this manner. The primary purpose is to assess a greater variety of effects due to the intervention. Differences in maternal and child linguistic speech/communication patterns, and maternal behavior; i.e., directiveness, responsiveness, encouragement, method of control are all factors that can all be studied only by using several different approaches. By comparing several systems to each other, we hope to yield information that will assist practitioners in selecting a system best suited to their needs and their population. In addition, valuable concurrent validity information will also result from utilizing the various systems.

Management of Posttesting

The collection of posttest data was also accomplished by on-site assessment supervisors and diagnosticians. Additional time was required during posttesting in order to accommodate the large number of measures. Most posttest sessions required at least two, two-hour sessions for complete data collection. Parents were paid an additional incentive for participating in more than one posttest session.

Projections for the Coming Year

Several criteria guided the selection of outcome measures for the EIRI research studies. These criteria include: (1) appropriate age range, (2) appropriate item content, (3) strong reliability and validity data, and (4) appropriate administration procedures for testing children with handicapping conditions. These criteria will continue to be applied to the selection of outcome measures, though different assessments may result in response to these criteria.

The Battelle Developmental Inventory. The Battelle Developmental Inventory (BDI) was selected as the core child measure due to its ability to meet the aforementioned requirements. The age range for the BDI is birth through age seven, which will accommodate the majority of subjects for the duration of the longitudinal studies. Subjects who were entered at age 5 years will most likely still be appropriate for continued assessment with the BDI beyond age 8 due to their delays in development.

The BDI is comprehensive in regard to item content, assessing the five major domains: personal/social, adaptive, motor, communication, and cognitive development. These domains will continue to be important throughout the subjects' development for the duration of the studies. However, other outcome measures may be needed to complement the results of the BDI. For example, as preschool children graduate into a kindergarten/public school program, the item content of the outcome measures must match the change in the child's curriculum and the general environment. The new curricula may have a more academic focus or an adaptive behavior/daily living skills emphasis, requiring an assessment tool to assess achievement in these areas. Each site coordinator must familiarize him/herself with the focus of the treatment in order to select assessments that agree with the needs of the children in the study.

During the first year of the longitudinal studies, the feasibility studies showed that the reliability and validity of the BDI were well-established. Concurrent validity studies that have been done recently confirm our decision that the BDI is a valid and reliable measure. Given the results of our own interrater reliability, the Battelle is worthy of continued use, though the coefficients are not as high as depicted in the manual. However, given the increased chance of disagreement in scores due to the 3-point scoring system of the BDI, it is our impression that our interrater reliability results are more realistic.

The Battelle is unique compared to other standardized assessment tools in that it contains standardized administration procedures for children with specific handicapping conditions. Though all of the research sites contain some children for which these adaptations are necessary, these standardized adaptations are especially important for the sites that involve children who are primarily hearing or visually impaired. Since handicapped children were not included in the normal sample, little data are available regarding the validity of these adaptations. EIRI's utilization of these adaptations will yield valuable norming information for hearing impaired and visually impaired populations. We are also continually collecting information regarding the appropriateness of the specific item adaptations via the trained personnel from these sites. Comments from these expert practitioners in the field suggest that generally these adaptations are appropriate. Revision recommendations for a few items have been recorded for the purpose of sharing these recommendations with the publishers of the Battelle if a revision occurs.

Family Measures. The selection of the family measures used this year was based on careful consideration of important variables when measuring family functioning. Currently these measures are being administered at both pre- and posttest time. The continuation of this data collection procedure will be based on each measure's ability to discern differences over the pre- and posttest period. If results show great stability in these variables over time, only posttest use will be considered. Comparisons across the measures will be made to determine any redundancies in the obtained information. Measures that do not differentiate in the data that they provide may be discontinued. The prototypes for the Report of Child Health and the

Parent Survey were developed this year; revision of these forms may be deemed necessary based on the results obtained this first year.

The family measures were selected with the intent that they would discriminate between the two comparison groups involved in each study. If results consistently show no difference in the two groups across all the sites, the interpretation could be that the treatment had no impact on these family variables. However, such results would also lead us to further investigate family measures that would be more sensitive to group differences and/or to identify tools that would reflect other critical variables in family functioning.

Complementary measures. The selection of appropriate complementary outcome measures is a continuous process that must be guided by the criteria previously mentioned. As we progress longitudinally throughout the studies, adjustments must be made to accommodate the developmental levels and treatment needs of the subjects.

Changes in outcome measures will be most urgently needed at those sites that serve children functioning at the birth to two-year level. Some of the assessments that are currently being used, such as the Bayley and the Movement Assessment of Infants will need to be replaced with measures that can be used with older children. However, the majority of the complementary measures have corresponding levels that can be used with preschoolers, such as the Carey Toddler Temperament Scales and the Preschool Level of the Early Intervention Developmental Profile.

We can anticipate changes that will need be made in the videotaped assessment procedures in regard to adjusting for the increase in the age of the subjects. For example, new videotaped assessment procedures for motor functioning will need to be developed for children functioning at approximately a 24-month age level if these procedures warrant continuation during the following year. The toys selected for the parent-child interaction videotapes may need to be replaced with more developmentally-advanced toys when videotaping children older than 5 years of age.

As was previously mentioned, additional complementary measures will be needed to more comprehensively assess achievement in the subjects as they reach school age. Though the BDI will provide standard scores and age equivalents for the five major areas of development, a grade level score may be desired for children who have been placed in academically-based programs. Specialized tests that assess the areas of arithmetic and reading would provide more specific information about the child's academic performance. Children with severe intellectual handicaps typically receive training to increase independent living, stressing domestic, vocational, recreation/leisure, and community functioning skills. The academics that are taught are generally more functional in nature, involving skills such as money handling, time management, and reading and writing for leisure and on the job. In order to assess the progress in these areas, criterion-referenced assessments such as The Program Assessment and Planning Guide for Developmentally Disabled and Preschool Children, and the AAMD Adaptive Behavior Scales may be considered.

In addition to such standardized measures, it is probable that some of the best information about the long-term effects of intervention will come from data about the incidence of special class placement, grade retentions and school achievement. Such measures have been used very successfully in other projects and are expected to be useful in the later stages of this study.

Assessment changes will most likely also be necessary at the sites that involve hearing impaired children. For example, criticism has been raised by researchers in the field in regard to the use of the Peabody Picture Vocabulary Test for assessing children with hearing impairments. Iconicity of test items on the PPVT may provide additional cues to children exposed to manual sign language, and therefore may be biased against children exposed to only an oral/aural approach to communication. EIRI is investigating the availability of a new version of the PPVT that has been designed for hearing impaired children that attempts to avoid the iconicity effect.

Few measures have been developed to assess a visually impaired child's use of their vision, a skill that will hopefully be increased due to the treatment. The Assessment of Visual Potential in Children with Severe Handicaps and the Erhardt Developmental Vision Assessment are two instruments that attend to the infant/toddler's use of vision, though little reliability and validity data have been published on these instruments. Still, they deserve consideration. As visually impaired children get older, measures to assess their specific academic skills, such as ability to read Braille will need to be utilized.

In conclusion, stability of measures across time provides valuable longitudinal information--this we hope will be obtained through the administration of the core measures. Yet, researchers must continue to analyze the type of specific treatment information that is desired and the most appropriate ways of achieving these results.

VERIFICATION OF TREATMENT IMPLEMENTATION

A variety of procedures for verifying treatment implementation have been used across the 16 studies and 2 alternate sites. Treatment verification procedures serve four purposes in the longitudinal research:

1. Independent and empirical confirmation that treatment is implemented as intended, and, where departures from the original plan occur, the opportunity is provided to remediate in the form of technical assistance;
2. The nature of data collection for the treatment verification process serves as a stimulus for self-improvement and consistent implementation;
3. A comprehensive description of research conditions which allow better understanding and generalizability of results; and
4. Data can be collected which document which subjects have participated more extensively so that this can be accounted for in the data analysis.

Rationale for the Verification Process

A major failing of many educational evaluations is that little or no attempt is made to describe and measure the services provided (Casto & Mastropieri, 1986; Evans & Behrman, 1977; Hall & Loucks, 1977; Rosenshine, 1970; Shaver, 1979). Often, researchers seem to regard experimental treatments as constants that are always implemented exactly as intended and do not vary from classroom to classroom or program to program. In studies of varied treatments, neglecting to determine degree of implementation can lead to erroneous conclusions (Cook & Poole, 1980).

These erroneous conclusions often have serious consequences for policy decisions. For example, in the Westinghouse study of Head Start (Westinghouse Learning Corporation, 1969), the lack of any information about which classroom practices were employed and how the variation in these practices affected outcome severely hampered the validity of the conclusions. Nevertheless, the results of this study, which showed no effect of intervention, nearly led to the discontinuation of the Head Start program by Congress. In a similar quasi-experimental evaluation, the Abt Follow Through study (Stebbins, St. Pierre, Proper, Anderson, & Cervaj, 1977), the only non-controversial finding was that the variation within models exceeded the variation among models (House, Glass, McLean, & Walker, 1978). This finding, in itself, is justification for including information on implementation so that results like this can be better explained. Indeed, in a complementary study, the Stanford Research Institute did measure the degree to which the various models were implemented and provided a more complete and fair evaluation than would have been possible without such data (Stallings, 1975).

A statewide study of compensatory preschool in South Carolina, conducted by the Early Intervention Research Institute (Barnett, Frede, Mobasher, & Mohr, 1987), illustrates how information on treatment implementation can completely alter the conclusions of a study. In this study, children in 14 classrooms were compared to a waiting list control group to determine the effects of a compensatory preschool program. The original analysis, which included all of the classrooms in the study, found no statistically significant preschool effect. However, when the treatment implementation data were analyzed, it was discovered that the two classrooms that had not implemented the program at even a minimal level were also the two classrooms that had a negative effect on the posttest score of the preschool group in comparison to the control group. The abnormally low implementation score of these two classrooms justified excluding them from the second analysis, which resulted in a significant preschool effect. Without data on treatment implementation, the conclusion would have been drawn that the program was not effective, but the "program" would have inappropriately included classrooms that did not implement treatment to even a minimal degree.

In another study conducted by EIRI (Mehren & White, in press), treatment verification data were gathered to determine the degree to which individual parents participated in a home-based parent tutoring program designed to enhance the reading skills of Chapter I-eligible kindergarten-aged children. It was found that when all children from this randomized experimental/control group study were included in the analysis, there were immediate but no long-term effects. When the analyses were limited to include only those children for whom the program had been implemented well, there were substantial and statistically significant long-term benefits. The conclusion that the program was effective, but only for those that participated fully, would have been missed had it not been for the treatment verification data.

Procedures

In the treatment verification procedures for the longitudinal studies, EIRI staff are using multiple data sources to cross validate treatment implementation data sources. These triangulation procedures (Denzin, 1978; Mercer, 1979) require that data from one source be verified or confirmed by data from other sources. In the case of treatment implementation, self-report data collected from intervention personnel are compared to data collected through direct observation and records. Data are collected on three entities:

- The Child
- The Family
- The Program

A core set of treatment verification instruments are used across all of the sites, while a number of other site-specific measures are used in certain sites. For example, in the Arkansas study, comparing the effects of a total communication approach to an oral/aural model with young hearing-impaired children, the opinions of the teachers on the effectiveness of the contrasting approaches are collected through a questionnaire. At the Association for Retarded Citizens site which contrasts basic group educational activities with individualized programming, periodic videotaping of treatment implementation takes place.

Data on the Child

- Individual Education Plans (Annually)
- Log of Individualized Services Provided (Monthly)
- Child Attendance (Monthly)
- Types of Services Child Has Received (Annually)

Data on individual children are collected in the treatment verification process in order to provide more specific information on each child that may help explain variations in the efficacy of treatment on different children, to document how treatment varies from child to child, and to ensure that individual children receive the treatment as it was intended, and, if not, to ameliorate the problem when possible.

Individual Education Plans are collected at each site as a partial measure of program quality and to provide more detailed information about the child and his/her needs which can later be helpful in analyzing data. For example, in one study, a child from the experimental group scored abnormally low on the posttest. On checking her IEP, it was discovered that a major objective for this child was to encourage her to talk with people other than her family. On further investigation, it was determined that she was severely withdrawn and did not respond well to the posttest situation, even though she had begun to behave normally in class. The IEP provided valuable information that guided the search for an explanation of her outlying posttest score.

The Log of Individual Services Provided is kept monthly by all intervenors (e.g., therapists, teachers, and home visitors), and is augmented with the monthly Child Attendance Records. Child attendance can be entered into the data analysis as a covariate to determine its effect on child outcome. In addition, children with very low attendance can be dropped from later analyses, since they obviously did not receive the full treatment. For example, in one project, first year attendance varied from 25% to 100%. These data will be helpful in analyzing results. In another project, attendance varied only from 80% to 95%, so it is not expected that attendance will be a useful explanatory variable in this particular site.

A related measure of treatment is gathered through a parent questionnaire. The Types of Services Child Has Received outside of the intervention program being studied are listed by parents. These services might include therapy from private clinicians, other community-based programs, and parental activities in the home independent of the intervention. This information helps ensure that varying treatments are not contaminated with other non-program interventions, and that differences between groups are indeed due to the intervention being studied.

Data on the Family

- Family Demographic Questionnaire (Prior to Intervention)
- Quality of Parent Involvement Form (Annually)
- Parent Involvement Materials (Weekly)
- Parent Satisfaction Questionnaire (Annually)

In order to ensure that differences between experimental and control groups are actually due to treatment variation and not characteristics of the home environment, the Family Demographic Questionnaire is given to each family prior to intervention with the child. This includes questions on family pattern, socioeconomic status, race/ethnicity, and age of parents or primary caregivers. Information is also gathered which will help the project find families who move out of the immediate area.

The home environment plays a crucial role in the progress young handicapped children can make. To partially capture how involved the studies' parents are with their child's education, the primary intervenors complete the Quality of Parent Involvement form to indicate the degree to which families have become actively involved in the intervention process. On a scale of high, medium, and low, the intervenors rate the parents' level of attendance at group meetings and conferences; their knowledge of their child's condition and their rights; and their participation in supportive activities, such as school projects, educational activities at home, and volunteer activities. This form is completed sometime near the end of the last semester.

To corroborate the intervenor's measure of family engagement, parents supply information on the amount of time they have spent in education-related activities at the center or at home. Collection methods for the Parent Involvement Materials vary from site to site, with some parents completing weekly post cards on their involvement, others receiving phone interviews, and others filling out charts. These Parent Involvement Materials are collected at the local site, and after the information is collated, it is sent to EIRI. Response rates from parents on this task have varied, and some revisions in the procedure may be necessary if this data is to be used with the individual family as the unit of analysis.

The Parent Satisfaction Questionnaire (PSQ), completed by all parents at the end of the program year, allows parents to express their opinions about specific aspects of their child's program; these include: the teacher, the communication between program and home, the goals and activities of the program , opportunities for parental participation, the range of services available, and their child's progress. Preliminary analysis of the PSQ data that have been collected show little variation in response across treatments and sites. This does not seem surprising, as it is probable that parents tend to like what they have. If the current trend continues and parental satisfaction does not vary across treatments, then elimination of this measure will be considered in order to reduce the burden on parents and local staff.

Data on the Program

- Description of Program Services (Annually)
- Supervisor Ratings of Quality of Staff Services (Annually)
- EIRI Staff Visits (2 times/year)
- EIRI Staff Telephone Contact (Weekly)
- Onsite Evaluations (Annually)

With the assistance of the EIRI coordinator, each site has prepared a Description of Program Services, which include program goals, a description of the community, an overview of services provided, and an explanation of the management team. These descriptions are useful in providing a brief introduction to new EIRI staff and in giving focus to site contacts and the onsite review (discussed below).

The Supervisor Ratings of Quality of Staff Services are completed at least once per year. The evaluation assesses teachers' proficiency and skills and provides them with feedback. Those sites which did not have a teacher evaluation system in place chose to use one of the example teacher evaluation forms provided by EIRI. One form provides evaluation criteria for several areas considered fundamental to most current teaching practices. It covers assessment, IEP development, IEP implementation, presentation of instruction, and instructional environment. The other form is designed to provide a gross measure of the quality of the work effort of the teacher. The data obtained from this form are based on the supervisors' perceptions of teachers' skills, problem-solving, work habits, relationships, communication, and attitudes.

In addition, Qualitative Ratings of Direct Intervenors are completed annually by their respective direct supervisors. These data are designed to provide information on how service providers compare to a larger peer group of persons in the same or similar positions. These type of data also add to our ability to describe the type of treatment environment which was prevalent during each study. These data are not intended to be used by supervisors to evaluate or provide feedback to staff, rather they will be used only for data analyses and descriptive purposes.

EIRI Staff Visits and EIRI Staff Telephone Contacts serve the purpose of both ongoing technical assistance and informal treatment verification. Site visits take place at least twice per year, and phone contacts are made weekly. Topics discussed include: random assignment of children, child assessment, curricular issues, management issues, and field testing of new methods.

Onsite Evaluations, conducted annually, collect information about the nature and quality of early intervention programs collaborating on research studies with EIRI. The site review procedures are designed for use by a team consisting of program staff from the collaborating site, a parent, and a member of the EIRI staff. Results of the review also serve as a needs assessment, providing site staff and administrators with useful information on which to base program improvement. Five general areas have been identified as part of this review. These areas include: (a) services for children, (b) interactions among staff and children, (c) curriculum, (d) administration and management, and (e) physical arrangements. A more detailed description of the Onsite Evaluations is given in a later section of this report.

Data Analysis

The treatment verification procedures have already begun to fulfill two of the purposes for which they were intended.

1. Independent and empirical confirmation that treatment is implemented as intended, and where departures from the original plan occur, the opportunity is provided to remediate in the form of technical assistance.

By the end of the project year, onsite reviews will have been conducted at each site. At some of those sites where they have been completed, important but modifiable departures from the intended treatment were found. For example, at the SMA/Lake McHenry site, the need to involve parents more actively in the parent-infant session was apparent. Technical assistance in training staff to improve in this area has been planned and will help to refine what is already a good program.

2. The nature of data collection for the treatment verification process serves as a stimulus for self-improvement and consistent implementation.

Sites have reported that completing many of the forms for documentation has resulted in more systematic service to children and parents. For example, the Log of Individualized Services form serves as a reminder to make up missed intervention sessions; attendance data prompts teachers to call parents about long-term absences; and rating parents and service providers on their participation and abilities spurs the rater to provide suggestions for improvement.

The last two purposes for treatment verification are directly related to data analysis. This year's treatment verification data are being entered into the computer, cleaned, and analyzed in conjunction with the posttest data. This should prove useful in answering some important questions. For example, in the study being conducted at the Arkansas School for the Deaf, if no differences are found between the children who received total communication and those who received oral/aural instruction, it would be necessary to ensure that children did not receive therapy or instruction outside of the center-based program. If, at the Louisiana State University intensity of treatment study with visually-impaired infants, it was found that the low intensity parent support group had a greater positive effect than the high intensity weekly parent-infant intervention, it would be necessary to investigate whether the low intensity group was, in fact, low intensity, or whether those parents reported more educational activities with their child than did the high intensity group.

The treatment verification procedures and their resulting data should provide results that are comprehensive, relatively easy to interpret, and that answer questions of relevance to service providers and researchers.

RANDOMIZATION PROCEDURES

The Longitudinal Studies of the Effects and Costs of Early Intervention with Handicapped Children includes 16 studies, each of which compares two or more alternative forms of early intervention. In each of the studies, children meeting pre-specified criteria are randomly assigned to one of the experimental groups. In each study, parents' informed consent to participation in the study is obtained prior to random assignment. Random assignment is done by researchers at EIRI so that:

- Each child has an equal chance of being assigned to any of the groups within that study.
- Service providers or parents cannot influence the decision about the group to which a particular child is assigned.

In each study, stratification techniques are used prior to randomization in order to increase the statistical power of the design and to reduce the probability of random fluctuation resulting in large pre-treatment differences between the groups on the variables most relevant to the outcomes being measured.

General procedures for random assignment vary from project to project, depending on whether:

- All of the subjects in a particular cohort (at least 20 subjects) are available for group assignment at the same time; or
- Subjects become available for assignment to one of the alternative treatment conditions as they are identified over an extended period of time (usually less than 5 subjects per month).

Procedures for each these two categories (one-time assignment versus ongoing assignment) are described below.

Studies With One-Time Assignment

Any study which has at least 30 children who can be assigned to alternative treatment groups at one time is included in this category. At the present time, those studies include:

a. Alabama Hearing Impaired
b. Arkansas Sunshine
c. New Orleans ARC

d. Des Moines
e. DDI
f. New York Association for Children with Down Syndrome
g. Arkansas Deaf
h. Reno

In each of these studies, the available population is stratified on two variables which seem particularly relevant to the outcome of the study. For example, in the Des Moines study, children were stratified by teacher ratings of high vs. low parent motivation as the one factor, and chronological age in months (27 to 42 vs. 43 to 54 vs. over 54) as the other factor. A maximum of six cells is created by the two variables selected (in other words, it is always a 2 x 2 or 2 x 3 stratification).

The specific variables used for stratification in each of the studies are described later in this report. Within each cell of the stratification, available children are rank ordered on a variable such as chronological age in months or pretest scores on a measure of child functioning. The children within each cell are then randomly assigned to one of the groups by taking the first pair of children in the rank ordering and flipping a coin to determine whether the first child goes to Group A or B. The remaining child in that pair goes to the opposite group. Additional children within the same cell are then alternately assigned in the same way to one of the two groups. When all children in the first cell are assigned, children in the second cell are considered. Using the same procedure, a coin is again flipped for the first pair, which determines the order of assignment for every other pair within the cell. This procedure is continued for every cell.

Studies With Ongoing Assignment

A number of the studies enroll children in the intervention program over an extended period of time as new children are identified. These studies include:

a. LSU IVH
b. LSU Visually Impaired
c. SMA/Lake-McHenry
d. Phoenix Children's Hospital
e. Citizens for the Disabled
f. Salt Lake City IVH
g. Wabash and Ohio

h. South Carolina IVH
i. Indiana

In each of the above studies, two variables have been selected which are thought to be correlated with anticipated outcomes. For each study,t he identified variables are used to create a two-by-two or three-by-three matrix (i.e., either 4 or six cells, respectively). As subjects are identified, it is noted where they fit with respect to the cells of this matrix. For subjects in each cell of a two-group comparison, there are four possible sequences of assignment where "a" indicated one of the two groups and "b" indicates the other group.

Sequence #1 = ABAB
Sequence #2 = BABA
Sequence #3 = ABBA
Sequence #4 = BAAB

For subjects in each cell of a three-group comparison, there are six possible sequences of assignment, where "a" indicates one of the three groups, "b" indicates a second, and "c" indicates the third.

Sequence #1 = ABCABC
Sequence #2 = BACBAC
Sequence #3 = CBACBA
Sequence #4 = CABCAB
Sequence #5 = BACBAC
Sequence #6 = ACBACB

When the child is identified for assignment to groups, it is determined whether the child is the first child to be enrolled in the project from that cell. If so, a die is cast (with either four or six numbers, depending on whether it is a two-group or a three-group comparison, respectively) to determine the assignment sequence to be used for the first group of children in that cell. The die cast for the first child in a cell determines the sequence of assignment for the next three (or five) children who are identified as belonging to that cell. For the next group of four (or six) children identified as belonging to that cell, the die is cast again to determine the sequence for that group of children. This process is repeated for each cell of the matrix as the first child in that cell is identified.

Sequences have been selected so that for any cell in which an even number of children are identified, assignments will be made in such a way as to balance the numbers in each group. It is also important to note that since there are multiple randomly selected "sequences for assignment," it is impossible for service providers to intentionally control the group to which a child is assigned by delaying the time at which the name of a particular child is forwarded to EIRI.

In each of these projects, children are identified as being eligible for the service program by someone at the service agency. Those names are then forwarded to the EIRI site coordinator who makes the random assignment following the procedures outlined above. Since there are multiple sequences to be used for assignment, and since service providers do not know which sequence is being used for any given children, there is no way they can influence the group in which a child is placed.

ECONOMIC EVALUATION

Economic evaluation is relatively new in early intervention research. Prior to the efforts of economic researchers at the Early Intervention Research Institute, few economic evaluations had been conducted in studies of young handicapped children and most of these were methodologically problematic (Barnett & Escobar, 1986). At EIRI we have attempted to establish guidelines for conducting economic research on early intervention and to develop new methods to address problems specific to early intervention research (Barnett, 1986; Escobar, Barnett & Keith, 1987).

The rationale for the EIEI work in this area is that evaluation of both costs and effects is necessary to consider the value of early intervention. The most effective program may not be the most "cost-effective." Likewise, the least expensive program may not be the most "cost-effective." Economic analysis allows us to evaluate costs and effects simultaneously, providing a more complete set of information for selecting the "best" program. Moreover, failure to account for the economic consequences of an intervention may not simply result in an inefficient program. It may actually lead to the failure of that program.

Cost-effectiveness is actually only one of several economic analysis techniques available for program evaluation. The other technique that is relevant to the proposed research is cost-benefit analysis. Although these terms are sometimes used interchangeably, they are distinctly different techniques (Levin, 1983).

Cost-effectiveness analysis is a way to study the relationship between program outcomes and program costs. It is most useful in considering alternative strategies to address the same problem. Programs can be compared on how much they accomplish with each dollar invested in them.

Cost-benefit analysis is a way to compare the dollar value of a program's advantages (benefits) to the dollar value of its disadvantages (costs). It requires a comprehensive measurement of program effects and the estimation of the economic value of those effects. Often cost-benefit analysis is only partially accomplished, with the researchers recognizing that some important program effects could not adequately be represented in terms of dollars.

For much of the institute's research, either benefit-cost or cost-effectiveness analysis may be appropriate. Which is used will depend on two factors: (1) the degree to which there are important multiple outcomes, and (2) the degree to which outcomes are amenable to monetary valuation. When there are multiple effects, cost-effectiveness does not always indicate a clear "winner" in program comparison. For example, if we compare two programs that affect motor and language skill development, we may find that one is superior in developing motor skills, while the other is superior in developing language skills. In such cases, benefit-cost analysis becomes more attractive because it lets us estimate the value people place on each type of outcome and sum those values to yield a single measure of benefit for each program. On the other hand, it is difficult to estimate a monetary value for many types of early intervention program effects, and this makes cost-effectiveness analysis more attractive. We anticipate that both techniques will be used to some extent, but until additional years of data are collected it is difficult to predict which technique will ultimately be used for a particular study.

Collection of Cost Data. Economic analysis requires that the components of each alternative treatment be clearly specified. Procedures for collecting detailed data have been developed, tested, and implemented at all of the study sites. Using all available sources (e.g., written documents and interviews with project staff), a detailed description was drawn up for each intervention. Descriptive data include: number of children by age, handicap, severity, and developmental level; number of direct service staff, administrators, and volunteers; other resources used in the intervention program; and type and extent of parent involvement. These data are combined with information on the unit costs of resources to produce estimates of total program cost and cost per child.

The primary reason that economic evaluation requires a specialized cost data collection system is that project budgets usually do not accurately reflect the total costs of a program. For instance, the value of parent time is not included as a cost. Yet, the care and education of a handicapped preschooler requires extraordinary amounts of a family's resources, especially parent time, under any circumstances. Parents with handicapped children who participate in interventions may be expected to contribute significantly greater amounts of their time than other parents. Indeed, parent participation in development of the individualized education plans alone may consume nontrivial amounts of time. These time costs are important for more than economic comparisons; if time costs are sufficiently high, they may be a barrier to participation for some parents, in particular low-income, single parents. Other resources that are frequently not found in budgets are the costs of initial staff training and set-up for a new program, "borrowed" staff, volunteers, and even facility costs. To overcome the problems with using budget figures, the costs of implementing each of the interventions studied are defined and measured using the "ingredients" method proposed by Levin (1975, 1983).

The ingredients approach is a systematic, well-tested procedure for identifying all of the social costs for implementing alternative programs, including costs that are often omitted from cost analysis such as contributed (in-kind) and shared resources. In this approach, an exhaustive list of resources used by each alternative is developed, and the ingredients are costed according to observed market values (e.g., salaries) or estimated market values (e.g., parent time). In some cases, it is necessary to prorate shared costs of a resource; for example, by estimating the proportional costs to one program using a shared building. Costs are then distributed according to constituencies, adjustments are made for transfer payments (which are not net costs to society) and total net costs are calculated. Using this approach, it is possible to ascertain the overall costs for each alternative program as well as the costs to various contributing groups. Since the concepts and skills involved in economic analysis are relatively new, most site staff are unfamiliar with the procedures. We have developed, tested, and revised the cost data collection forms so that they do not require a background in economic analysis to generate accurate cost data. Thus, staff at each site are able to collect data with a minimal level of support from our staff.

Cost-effectiveness analysis procedures. The comparison of costs and effects differs between cost-effectiveness (CE) and cost-benefit analysis (CBA). CE analysis uses a series of matrices that display the costs and effects of each intervention. A hypothetical cost-effectiveness matrix is given in Table II.2. Such a matrix displays the relative strengths and weaknesses of each of the interventions in an easily read format. Program C, for example, is associated with more motor skills and positive

Table II.2

Hypothetical CE Matrix for DQ, Motor Skills, and Positive Responses Across Three Interventions (A, B, C)

	Cost Per Child			Effects			
	Total	Parents	Project	DQ[a]	Skills[b]	Responses[c]	Attitude[d]
A	1,050	550	500	3	12	15	4
B	1,750	1,400	350	9	5	4	5
C	1,800	600	1,300	0	20	17	9

[a] Mean gain in DQ
[b] Mean number of skills mastered
[c] Mean number of positive responses in one trial
[d] Mean attitude-toward-child score on a 10-point scale where 10 is positive and 1 is negative

responses than are programs A or B. However, Program C has higher costs and lower developmental quotients (DQs). The matrix approach allows several different comparisons to be made on program costs and effects. For example, costs can be separated by the groups bearing the expense of the resource, or effects can be displayed according to the type of handicap, severity of handicap, or age served.

This analysis and display procedure is used instead of the direct computation of simple cost-effectiveness ratios for several reasons. First, it may be inappropriate for the evaluators to decide which cost breakdowns and effects are the most important. For instance, some persons may value parent satisfaction more than DQ while others may have the opposite priority. In another instance, a CE comparison disregarding parent time may be desired (if one wants to know what is feasible based on public school resources, for example). The ultimate cost-effectiveness comparisons must be left to the decision-making body. Second, this format displays the distribution of the intervention costs and effects. For example, in Table II.2, the parents in Program B bear more of the costs than do parents in Program A or C. However, the parents in Program C benefit more from better attitudes than parents in Program A or B. This disaggregation provides decision-makers with valuable information about political and social impacts of the program and potential disincentives or incentives to parent participation. Third, the matrices are easily comprehended by readers without an economics background. Thus, the data are available to a wide audience, increasing the usefulness of the cost-effectiveness data. Fourth, cost-effectiveness ratios do not provide a reliable ranking of programs in terms of economic efficiency (Barnett, 1986).

Cost-benefit Analysis Procedures. Cost-benefit analysis (CBA) is most important when the economic implications of outcomes are readily estimated. For example, a program may reduce special education costs or need for therapy, and the economic benefits of this to society can at least be roughly estimated. Because the process of estimating the dollar value of intervention outcomes is almost always incomplete, it yields a conservative estimate of the net economic return to society. However, such analyses can be accomplished with early intervention studies to a much greater extent than non-economists often suppose, as demonstrated by the economic evaluation of the Perry Preschool Project (Barnett, 1985a; b). For the institute's analyses, three types of measures can be used to quantify the benefits of early intervention.

> Savings in costs of care and education. One measure of benefits is the cost savings which are generated by increasing the capacities of handicapped preschoolers, or improving the efficiency of the service delivery system. These cost savings may derive from: organizational, procedural, or staff changes that reduce intervention costs; a reduction in the intensity or duration of later special services; or an intervention that provides a better transition to later services and so increases productivity or reduces cost. For example, the Perry Preschool Study analyzed cost savings in education and social services (Barnett, 1985a; Berrueta-Clement et al., 1984). Significant cost differences were observed as early as two and three years after the intervention. Seitz, Rosenbaum, and Apfel (1985) found similar kinds of educational savings from an intervention program that focused on families and began at birth.
>
> Cost savings to households. Families with handicapped children have substantially higher child-related expenses of time and money than do families without handicapped children. This applies to many ordinary activities as well

as to special activities not required for non-handicapped children. One way that we can measure cost savings is to compare time use and out-of-pocket expenditures for sample families participating in interventions.

Willingness-to-pay by households. The most complete benefit estimation procedures estimate the value of an intervention program and its effects to families beyond the cost savings discussed above. The techniques used to produce more complete estimates of benefits are generally classed as either (1) "hedonic" approaches or (2) direct measures of willingness-to-pay. The hedonic approach involves the estimation of a "household production function" based on expenditures of money and time by household members on various goods and services (Lancaster, 1966), or the identification of differing prices or wages accepted in order to participate in the activity. Estimation of a household production function can involve difficult theoretical and empirical problems and requires relatively large amounts of detailed data collection by household (Barnett, 1977; Barnett, 1983; Muellbauer, 1974; Pollack & Wachter, 1975).

The second approach to valuation, direct elicitation of willingness-to-pay through "bidding games," might also be successfully applied to early intervention programs and their effects. However, strategic and other biases which are often suspected in hypothetical responses may be a problem. Also, it is sometimes difficult to elicit responses from individuals in cases where very detailed descriptions of the "game" must be used; this would be the case for valuing specific treatment variations in intervention components. The economic analysis staff have developed possible solutions to these problems, however, and have had some success in using this approach. For example, Escobar, Barnett, and Keith (1987) were able to obtain reasonable estimates of parents' valuation of a preschool program for handicapped children. These estimates were highly consistent with predictions based upon economic theory. We have been experimenting with the form of survey used to collect data in several "pilot" sites.

Summary of This Year's Economic Analyses

Complete cost and outcome data were not available for analysis at the time this report was prepared. The process of collecting, reducing, and analyzing all of the data to be used in the economic analyses is on schedule, although cost analysis is in varying stages across the sites. For some sites, cost-effectiveness analysis is now underway. For others, the cost analysis itself is still incomplete, or the number of subjects with complete outcome data is not yet sufficient for analysis. Cost analyses have been completed for four sites, however, and the results are presented in this section. The ways in which the cost information will ultimately be used were explained in the previous section, but some of the more interesting implications of the cost data are discussed here. In addition, we present and discuss the results of a test of contingent valuation surveys at a site in Salt Lake City. A contingent valuation survey has also been implemented at the New York site, but data are only now being received and processed for analysis.

Complete estimates of cost per child have been produced for four of the longitudinal studies: Arkansas School for the Deaf, Sunshine School/Richardson Center, Wabash and Ohio, and Salt Lake City IVH. In each case, estimated cost per child was calculated by dividing the total cost of all resources for each alternative treatment by the number of students enrolled in that treatment program. Cost estimates by program are presented in Tables II.3 to II.9, with subtotals for major cost categories. As can be seen, all programs used personnel, capital equipment and facilities, transportation, materials and supplies, and utilities. In addition, several programs used volunteers and consultants; for those programs, costs were estimated with and without the estimated cost of volunteer time. The cost of an hour of parent or other volunteer time was estimated at the national average wage of $8.74 per hour. In some situations parent costs may not be relevant, and the specific value to be attributed to parent time is highly debatable given the limited information we had about parent time use in these studies. In order to provide for comparability and to make the cost estimates as meaningful as possible, all program costs were adjusted for inflation using the Implicit Price Deflator for the Gross National Product and are reported in 1986 dollars. The estimation of cost in each study is described in detail below. A wide variation in program costs was found and the concluding section discusses the reasons for this variation and other lessons learned from the cost analysis.

Arkansas School for the Deaf. The Arkansas School for the Deaf study compares the difference between an oral/aural and total communication approach in a center-based program which includes a home intervention component. The primary focus of intervention in the oral/aural group is on the development of auditory and verbal language skills. Motor skill development is also emphasized. The program for the total communication group is the same except that these children also learn how to sign. For both groups, the SKI*HI curriculum is used at home. Children in the program range from 18 to 60 months and have a hearing loss of 50 decibals or greater.

Six full-time and six part-time staff members were employed by the Arkansas School for the Deaf in five programs serving 63 children. The staff-child ratio was 1:2 to 1:5. The center-based program ran 3 hours per day, 4 days per week for 9 months. Aides volunteered 303 hours in the classroom. In 3 of 4 classes, the aide was a parent of a child in the class, otherwise parents did not participate in the center programming. Parents spent an average of 4 hours per week on the SKI*HI curriculum at home. Transportation was provided by parents who spent a total of 1,748 hours driving children to the program. Cost did not vary between the two treatments compared as the teaching "technology," not resources, was the difference studied there. However, there was considerable variation among the Arkansas programs (which were in both urban and rural locations), leading us to estimate costs separately for each program. The cost estimates provide a measure of incidental variation in treatment intensity across programs.

Tables II.3 and II.4 contain the cost estimates for the Arkansas programs. As with all of the interventions studied, personnel cost accounted for the vast majority of cost at all of the sites, an average of 77% of total cost. Excluding the cost of volunteer time, cost per child was $4,100 at Little Rock, $2,535 at Forrest City, $3,398 at Van Buren, $2,880 at Fayetteville, and $5,373 at Russellville. Table II.3 shows that the addition of the cost of parent and student volunteer time increases substantially the cost per child.

Parents spent an average of 56 hours per year with program staff and 198 hours per year working with their child at home using the SKI*HI curriculum. This represented an average of 254 hours per year on program activities. Parents also spent an average of 30 hours on transportation. These estimates are based upon parent and program report and represent a ballpark estimate of the actual amount of time parents spent in program-related activities. Most of the variation in cost

Table II.3

Cost Per Child for Arkansas School for the Deaf (1986 Dollars)

Resources	Little Rock (N = 12)	Forrest City (N = 15)	Van Buren (N = 13)	Fayetteville (N = 14)	Russellville (N = 9)
Personnel	$2,634	$1,882	$2,667	$2,059	$3,368
Student Aide (Volunteers)	0	0	0	0	0
Parent Time (Volunteers)	0	0	0	0	0
Facilities	721	231	248	336	1,163
Equipment	215	72	107	74	192
Transportation	497	343	318	404	458
Materials/Supplies	33	7	8	7	11
Total Cost	**$4,100**	**$2,535**	**$3,348**	**$2,880**	**$5,373**

Table II.4

Cost Per Child for Arkansas School for the Deaf Program: Parent and Student Volunteer Time Valued at Average Wage (1986 Dollars)

Resources	Little Rock (N = 12)	Forrest City (N = 15)	Van Buren (N = 13)	Fayetteville (N = 14)	Russellville (N = 9)
Personnel	$2,634	$1,882	$2,667	$2,059	$3,368
Student Aide (Volunteers)	221	0	0	0	0
Parent Time (Volunteers)	2,552	2,394	2,350	2,519	2,630
Facilities	721	231	248	336	1,163
Equipment	215	72	107	74	192
Transportation	497	343	318	404	458
Materials/Supplies	33	7	8	7	11
Miscellaneous	0	0	0	0	181
Total Cost	**$6,873**	**$4,929**	**$5,698**	**$5,399**	**$8,003**

among the sites is due to fluctuations in the relatively small number of children served with a fairly standard resource plan (except for Little Rock, one teacher and an aide in one classroom).

Sunshine School/Richardson Center. The Sunshine School and Richardson Center programs included in this study were home-based interventions that used professional teachers as home visitors in rural Arkansas. Costs of the two programs were estimated separately. In this case the comparison was between a treatment consisting of 8 home visits and 4 therapy sessions per month and a treatment consisting of 2 home visits and 1 therapy session per month. The focus of home intervention by the teacher was primarily on the child aimed at improving self-help, communication, and gross motor skills. Teachers modeled behaviors for parents and provided parent education. Children came to the center for speech, physical, and occupational therapy sessions. Home visits lasted from 1 to 2 hours, therapy sessions were a half hour. Costs of direct service staff and non-personnel costs were allocated to the two treatment groups in direct proportion to the amount of treatment received. Costs of administration, assessment, and program planning were allocated on a per child basis.

The personnel of the Sunshine School program consisted of a part-time program coordinator and part-time administrative director, five full-time home teachers, two part-time speech therapists, and one part-time physical therapist. The program served 50 children 3 to 48 months old with mild to severe disabilities, 24 in the more intensive and 26 in the less intensive treatment group. Two children were not involved in the research study. Parents were asked to spend 20 to 60 minutes daily using intervention techniques at home a possible 25-50 hours annually. Parents also had to drive their children to the center to receive therapy four times or one time per month, depending on treatment group. Based upon average round-trip mileage, time spent at the center, and time spent using intervention techniques in the home, the time required of each parent was estimated to be about 300 hours annually for the more intensive group and 400 for the less intensive group. Cost estimates with and without parent time and transportation costs are presented in Tables II.5 and II.6, respectively. The average cost per child was $4,325 for the more intensive treatment group and $1,751 for the less intensive group, excluding parent costs. The costs per child for the two groups were $7,616 and $6,138 including parents' transportation costs and time valued at the average wage.

The Richardson Center program employed two full-time home teachers and, on a part-time basis, an administrator, director, bookkeeper, secretary and nurse. The program served 18 children, 9 in the more intensive and 9 in the less intensive group. Four of the children were not involved in the research study. Speech therapy and physical therapy were provided by consultants hired on an hourly basis. Again, parents were asked to work with their child at home and brought their children into the center for therapy. The home visit and therapy schedules for the more and less intensive groups were the same as for the Sunshine School. Estimated cost per child by resource category is presented in Tables II.5 and II.6. Average cost per child was $5,519 for the more intensive group and $2,460 for the less intensive group. Accounting for parent transportation and time costs, the average cost per child for the two groups was $8,512 and $4,583.

Wabash and Ohio. The Wabash and Ohio study, located in rural Illinois, compares two groups that begin early intervention at different ages, before age 3 and after age 3. Of the total sample of 56 birth to 30-month-old mildly handicapped children, 32 attended a morning or afternoon, while 24 received home visits one time per week. The group assigned to receive center-based intervention prior to age 3 attended a center-based program 5 days per week, 2-1/2 hours daily for 9-1/2 months. The other group received weekly home visits throughout the entire year, lasting 1 to 1-1/2 hours each. Self-help, communication, and motor skills were emphasized in the center-based program in conjunction with typical preschool activities. The staff-child ratio in the classroom was approximately 1:4. Children in the center were

Table II.5

Cost Per Child for Arkansas Sunshine and Richardson Center (1986 Dollars)

Resource	Sunshine High Intensity (N = 24)	Sunshine Low Intensity (N = 26)	Richardson High Intensity (N = 9)	Richardson Low Intensity (N = 9)
Direct Service	$2,627	$ 808	$1,774	$ 591
Administrative and Support Staff	599	599	931	931
Consultants	0	0	1,476	492
Volunteers	0	0	0	0
Facilities	138	42	750	250
Equipment	124	38	95	32
Transportation	313	96	97	32
Materials/Supplies	131	47	68	23
Utilities	101	31	187	62
Insurance	130	40	141	47
Miscellaneous	162	50	0	0
Total Cost Per Child	$4,325	$1,751	$5,519	$2,460

Table II.6

Cost Per Child for Arkansas Sunshine and Richardson Center: Including Contributions and Professional and Parent Volunteer time (1986 Dollars)

Resource	Sunshine		Richardson	
	High Intensity (N = 24)	Low Intensity (N = 26)	High Intensity (N = 9)	Low Intensity (N = 9)
Direct Service	$2,627	$ 808	$1,774	$ 591
Administrative and Support Staff	599	599	931	931
Consultants	0	0	1,476	492
Volunteers	3,135	4,339	2,896	2,091
Facilities	138	42	750	250
Equipment	124	38	95	32
Transportation	469	144	194	64
Materials/Supplies	131	47	68	23
Utilities	101	31	187	62
Insurance	130	40	141	47
Miscellaneous	162	50	0	0
Total Cost Per Child	**$7.616**	**$6,138**	**$8,512**	**$4,583**

evaluated by occupational, physical, and speech therapists. Home teachers directed developmental activities with the child, modeled techniques for parents, and provided parent education. The children in the home-based group will attend the center-based program when they are 3 years old.

Cost estimates for the two programs are presented in Tables II.7 and II.8. The personnel of this program included a part-time coordinator, four full-time teachers, two aides, and administrative and support personnel. Some assessment services were obtained from consultants. There were no volunteers in the center, but parents in the center-based group reported spending 5.6 hours per week working with their child at home and parents in the home intervention group reported spending 4.8 hours per week on home intervention activities. The cost estimates for non-personnel resources were based on actual expenditures, except in the case of facilities which were

Table II.7

Cost Per Child for Wabash and Ohio (1986 Dollars)

Resource	Early-Intensive Intervention (N = 32)	Later-Intensive Intervention (N = 24)
Personnel	$2,898	$2,191
Consultants	20	20
Volunteers	0	0
Facilities	161	16
Equipment	44	42
Transportation	347	210
Materials/Supplies	81	42
Utilities	138	0
Total Cost Per Child	**$3,689**	**$2,521**

Table II.8

Cost Per Child for Wabash and Ohio: Including Parent Volunteer Time (1986 Dollars)

Resource	Early-Intensive Intervention (N = 32)	Later-Intensive Intervention (N = 24)
Personnel	$2,898	$2,191
Consultants	20	20
Volunteers	2,471	2,182
Facilities	161	16
Equipment	44	42
Transportation	347	210
Materials/Supplies	81	42
Utilities	138	0
Total Cost Per Child	**$6,160**	**$4,703**

donated. Facilities cost was estimated based on the square footage used and the average cost per square foot of comparable center-based programs (Ruopp, Travers, Glantz, & Coelen, 1979). Average cost per child was $3,689 for the center-based program and $2,521 for the home-based program, excluding parent time costs, and $6,160 and $9,703 for the center- and home-based programs, respectively, with parent time costs included.

Salt Lake City IVH. The Salt Lake City intervention program for infants with intraventricular hemorrhage was part of an age-at-start study where intervention was begun at 3 months for the intervention group and is beginning for the late starting group at 18 months. There was no comparable intervention in the first year for the late starting group, but they did receive the same intensive medical intervention as the other children. Thus, the costs for the intervention group were estimated in the context of the larger cost of securing the infants' survival. These costs include all of the services (medical and nonmedical) rendered in the hospital setting. The costs of the intervention that was implemented after the infant was discharged from the hospital are viewed as a marginal increase in an already large investment in the infants' survival. This marginal increase is aimed at improving the infant's quality of life. The main intervention activity was performed by a licensed physical therapist either in the child's home or in a center. The focus of the intervention was upon the development of motor function as needed on an individual basis. A child development specialist meets with each parent and child 1 hour a month. The physical therapist spends 2 hours per month or less with each child.

Hospital intervention costs were estimated based on the number of days in three stages of hospital care and average daily cost for that care. The first and most expensive care stage is residence in the Neonatal Intensive Care Unit (NICU) with daily charges of $689 for the hospital stay and $110 for physician services. The second stage is intermediate care out of the NICU, but still requiring more services than a normal newborn, with daily hospital charges of $469 and daily physician services charges of $85. The third stage is that of the NICU "graduate" who needs only the usual level of services, for which hospital charges are $249 per day and physician charges $60 per day. It should be noted that these are average charges and that in cases where extremely high levels of services were required, physicians would have itemized critical care charges and not used the standard daily rate. However, those cases are distinct outliers and were omitted from our characterization of the typical cost of hospital care for infants with IVH.

The early intervention program for the IVH infants employed a development specialist, graduate student, and a secretary on a part-time basis. A physical therapist was employed on a consulting basis. Parents volunteered approximately 400 hours performing therapy in the home. Efforts are continuing to provide a more accurate estimate based on self-report of the number of hours contributed by each childs' parents.

The estimated cost per child is presented in Tables II.9 and II.10, based upon the number of days each infant spent at each hospital care level and the cost of intervention after discharge. The average cost of hospital care was $36,087. The post-hospital intervention added $854 excluding the cost of parent time, and $4,350 with parent time valued at average wage.

Table II.9
Costs Per Child for Salt Lake City IVH

Resources	Cost Per Child
Hospital Charges (n = 45)	$36,087
Intervention (n = 20):	
Personnel	$ 1,054
Consultants	735
Parent Volunteers	0
Facilities	83
Equipment	39
Transportation	19
Total Intervention Cost	$ 1,930

Table II.10
Costs Per Child for Salt Lake City IVH: Parent Time Valued at Average Wage (N = 45)

Resources	Cost Per Child
Hospital Charges	$36,087
Intervention:	
Personnel	$ 1,054
Consultants	735
Parent Volunteers	3,496
Facilities	83
Equipment	39
Transportation	19
Total Intervention Cost	$ 5,426

Discussion

The results of the cost analysis allow a preliminary interpretation, which is quite limited without reference to the effects generated by each of the early intervention programs. We can, however, make several observations with respect to the wide variation in programs' costs, the effect on cost of volunteers, and cost differentials between program settings and intensities.

The cost analyses indicate that there is substantial variation in cost across programs which are in many ways very similar. There are several reasons for such variations across the sites. The first is attributable to the differences in program size. When programs are quite small, as these are, fairly small differences in the number of children served can have a big impact on average cost. In other words, there are significant economies of scale. The cost per child decreases as more children enter the program and the program experiences favorable economies of scale. As more children enter the program, the amount of administration, space, etc., does not need to increase. As enrollment grows, however, the program cost per child may have to rise sharply to bring in new resources and facilities required to serve children entering the program. Again, cost per child will level off and begin to decline as the program moves to full utilization of its resources. Thus, average costs can be uneven because of relatively small differences in numbers served. This accounted for a large part of the cost differences.

A second source of cost differences was that there was a large variation in the role of volunteers and parents. In each site for which a cost analysis was conducted, the estimated cost of volunteer time represented a significant portion of the total program cost. This can be attributed largely to the fact that parents played an important role in each program with respect to intervention. Therefore, we observed a substantial shifting of the cost burden of the program from the program to parents. For the Salt Lake IVH site, our cost analysis indicated a very high cost to parents of infants with intraventricular hemorrhage in general. If one includes hospital charges paid by families and the cost of intervention, the cost borne by families was 98%, and the cost to society was only 2%.

Finally, we observed a fairly large cost reduction from high intensity programs to low intensity programs. However, this difference was smaller than might be naively expected because there are many fixed costs, such as administration, facilities, and other capital goods. These remain much the same over a limited range of intensity. Our analyses indicated that the low intensity programs cost only 1/2 to 1/3 as much as the high intensity programs. However, the low intensity programs provided a disproportional lower number of direct service hours for that cost.

In terms of what we have learned in the collection of these cost data, we have found the cost forms to be a reliable and efficient means of data collection. In most cases, it is possible to have programs self-report their resources and come up with reliable data. Using our cost data collection system, and given a good rapport with the program and/or the individual completing the tedious task of compiling the cost data, most questions can be resolved via telephone after we have received and reviewed the data.

At this point, the results are of limited usefulness in that they tell us something about costs, but leave us guessing about the other side of the cost-effectiveness equation. (An exception being the contingent valuation study. Which tells us something about benefits.) As outcome data on the sites are analyzed and cost estimates are completed for all of the sites, we will begin to be able to answer the more meaningful policy questions. Of course, even those answers will be considered tentative and will be updated as additional longer-term outcome data become available.

Pilot Study Using the Contingent Valuation Method

Researchers conducting cost-benefit analyses of educational programs for disadvantaged or handicapped children often encounter difficulties in attempting to measure program benefits. One reason for the difficulties is that many of the benefits may be intangible (Zigler, 1979). Another is that some benefits may be difficult to measure with existing instruments (Garwood, 1982; Zigler & Balla, 1982). Especially for severely handicapped children whose progress is slow, standardized tests may not be sensitive to small, but important, changes in ability produced by an educational intervention (Committee on Education and Labor, 1986; Strain, 1984). A recently developed technique of economic analysis, called contingent valuation, may help researchers to obtain more complete estimates of the economic value of difficult-to-measure benefits of educational programs.

In this section, we describe the use of contingent valuation to estimate the economic value of the benefits of a preschool education program for handicapped children. Although an important advantage of the contingent valuation method is the increased range of benefits which may be estimated, contingent valuation is recommended as an addition to, not a replacement for, more traditional methods of economic evaluation. No single method of economic evaluation is likely to produce a very complete estimate of the benefits of an educational program, and the use of multiple methods offers the added advantage of allowing researchers to triangulate on different methods' estimates for the same benefits.

Description of the Method. A contingent valuation survey is typically conducted by personal interview, which the researcher uses to simulate a market situation (purchase decision) for the respondent. In the interview, respondents are asked to indicate either their willingness-to-pay for a service which they do not pay for directly or their willingness-to-accept compensation if the service could no longer be provided. The interview process is critical to the success of the survey because it greatly influences the quality of the elicited willingness-to-pay (or willingness-to-accept) responses (Cummings, Brookshire, & Schulze, 1986). The interviewer must create a hypothetical situation which simulates the environment of a market transaction as closely as possible in order to elicit responses that are similar to those consumers would make in a real purchase decision. However, the respondents must believe that responses to the interview will in no way affect the services provided and that they are not really going to be asked to pay for services. Otherwise, responses might reflect strategic behavior by respondents seeking to influence the quality or price of services.

Contingent valuation was originally developed to estimate the value of intangible benefits from improving environmental qualities such as clean air, clean water, and a clear view (Randall, Ives, & Eastman, 1974; Brookshire, Ives, & Schulze, 1976; Rowe, d'Arge, & Brookshire, 1980; Desvousges & Smith, 1982; Rae, 1981, 1983). One or more attributes (e.g., price, quantity, quality) of the commodity to be valued are made contingent in the interview process. For example, Desvousges, Smith, and McGivney (1983), in their study of the value of water quality to lake recreators, asked respondents the value of a change in water quality from boatable to fishable and from fishable to swimmable (i.e., if water quality was X, what would you be willing to pay?). In the present study outlined below, we asked, "If public preschool education were not 'free,' what would you be willing to pay?" Therefore, what is "contingent" depends entirely upon the commodity in question.

Interview Techniques. Cummings et al. (1986) described the necessary conditions for a survey which would elicit an accurate measure of benefits: (a) The subjects should be familiar with the commodity to be valued; (b) they should have had some prior experience in consumption of the commodity; (c) there must be no uncertainty regarding the respondent's role in the valuation process; and (d) willingness-to-pay measures must be used rather than willingness-to-accept measures because extensive research has indicated that the latter measure overestimates the value of the commodity.

Several techniques may be used to elicit respondents' values for an educational program. In the simplest, respondents are asked how much they would pay for the program. Another is closed-ended bidding in which respondents are given payment cards containing a range of values from which they are to choose one. Another technique is iterative bidding. Beginning with a low (high) value, the interviewer asks if the respondent would be willing to pay $X for the program or service in question, and increases (decreases) X until the maximum the respondent is willing to pay is reached. The iterative process is important in that it offers respondents an opportunity to adjust their responses, but it poses several problems, i.e., people may become bored with the iterative process and stop before their true maximum is reached; or, the choice of a starting point in the iterative process may introduce bias. Empirical research suggests that a combination of the iterative bidding approach and the payment card method yield the most accurate responses (Coursey, Schulze, & Hovis, 1983), i.e., after choosing a value from the payment card, the respondent is asked if she or he would pay $X more until the maximum is reached. This technique eliminates the possibility of boredom and starting point bias (because the respondent chooses the initial value).

Data

The participants in the pilot study were parents of mild to severely handicapped children enrolled in four special education classes in the Jordan Valley School District, a district south of Salt Lake City, Utah. Children in the sample had a variety of handicapping conditions. Thirty-four percent had communication disorders, 26% were mentally retarded, and the remaining 40% were neurologically impaired. One of the classes was self-contained; the other three were mainstreamed classes located in three high schools in the area. The program ran 2-1/2 hours per day, 5 days per week over a 10-month period. Curricula were similar in each of the classes. Speech therapists and physical/occupational therapists provided services to the children who needed them. The families were primarily middle income. Median household income for the sample was $27,500 (1987 dollars).

Contingent Valuation Survey. All parents with children in the program were asked to participate in the study. Interview times were set up when parents would be at the program either dropping off or picking up their children. A total of 54 contingent valuation surveys were completed. The purpose of the study was explained to parents. Then, two different surveys were randomly distributed to the respondents so that approximately half the group filled out one, and half the other. The two surveys differed in that one gave information on the costs of private daycare programs offering similar hours of care. In the survey, parents were asked to assume that they would be required to pay tuition for their child's program. Given this hypothetical situation, they were asked the maximum amount they would be willing to pay, in addition to monthly fees some parents were already paying, to have their children attend the preschool program. Willingness-to-pay was indicated by choosing one value from a range of values on the questionnaire, from $0 to $35,000. Respondents were also encouraged to choose values that may fall between or be greater than the values given. To be sure that the value they chose was their maximum willingness-to-pay, they were also asked to state what additional amount they would pay, if any, if their initial bid was not enough to maintain the program and it would have to be discontinued unless more money was available. Those who chose $0 were asked to indicate their reasons, financial or otherwise, in order to identify respondents who may have been protesting the methodology. As a control for strategic behavior, parents were reminded that the data would never be used as a means to charge them for the program and that, in fact, with the implementation of P.L. 99-457 their children would be guaranteed a "free and appropriate" education.

Results. Data have not yet been completely analyzed, but we can report the monetary values parents gave for the program. These results are briefly compared to those of a similar study conducted for an early intervention program in Iowa in 1983-84.

There were basically three monetary values obtained from parents: (a) willingness-to-pay measure, where parents were asked to choose a value or fill in their own amount; (b) the amount each family paid in fees; and, finally, (c) the maximum willingness-to-pay measure, the additional amount they bid when asked if they would pay more than their first bid if the program would be discontinued. It was assumed that the addition of these three values would equal maximum willingness-to-pay, the correct measure of social benefit.

The mean maximum willingness-to-pay for the Jordan Valley program was $2,139. This amounted to 8% of median income. By comparison, the Iowa bid was lower than the bid for Jordan Valley. This was not surprising as income was also much lower for the Iowa group than for the Jordan Valley group. In 1986 dollars, the Iowa bid was $638 and amounted to 4% of median income ($18,040, in 1986 dollars). The results also indicated that asking parents for their additional willingness-to-pay if the program were to be discontinued resulted in significantly higher mean bids. This implies that not asking this question yields values which are somewhat less than maximum willingness-to-pay. It may be one reason that the Iowa bids were lower relative to income than the Jordan Valley bids. Finally, no significant difference could be detected between the mean bids for families receiving information on the cost of daycare and those which did not.

Discussion. Contingent valuation is a promising new technique for use in benefit-cost analysis of early intervention. Willingness-to-pay estimates obtained from a contingent valuation survey of parents with children in preschool special education were substantial, and the vast majority of parents (87%) reported that they were willing to pay a non-negligible amount for this service. However, the analysis is not complete. Having conducted the Iowa contingent valuation survey already (Escobar, Barnett, & Keith, 1987), we can now build upon our earlier model. Using maximum likelihood techniques, we plan to investigate the influences on expressed valuation of early intervention of variables such as income, mother's education, and the child's handicapping condition with the Jordan Valley data. All of those variables were powerful predictors in the Iowa study.

The next step in our research with contingent valuation is to use the technique with the longitudinal study sites where it seems most appropriate. With enough of these studies, we will gain some idea of the stability of parents' valuations relative to income, the influences of other family characteristics, and the differences in program characteristics.

ONSITE EVALUATIONS

Each of the 16 studies, which are a part of the **Longitudinal Studies of the Effects and Costs of Early Intervention for Handicapped Children**, is being conducted in conjunction with an ongoing service program which is independent of the Early Intervention Research Institute. These sites, some of which are state operated and some of which are private agencies, have agreed to collaborate with EIRI and to abide by the conditions of the research protocol in order to answer the questions posed by the study regarding the effects and costs of early intervention with handicapped children. One advantage of conducting this research in conjunction with ongoing service providers, is that the applicability of the results will have broader application than if the studies were conducted in less typical settings.

Although the enhanced generalizability of the studies is an advantage, it is critically important that there be evidence that each of the collaborating sites operates a high-quality program which is using state-of-the-art techniques in their early intervention program. Obviously, there are legitimately different philosophical orientations and curricular approaches to providing effective early intervention programs. But, undergirding such differences is a general set of principles and practices which are recognized to be important in any high-quality intervention program. Some of these are mandated by law (e.g., the Education of the Handicapped Act as amended by P.L. 94-142), others have gained broad acceptance as a result of ongoing practice and previously-completed research.

The EIRI coordinator for each research site is responsible to ensure that each alternative intervention program at a particular site is consistent with such state-of-the-art practices. This is done by site visits during the year, as well as weekly telephone calls to monitor the activities of the site. In addition, a liaison person is identified at each site who has expertise in providing early intervention services. In each case, this person is an employee of the collaborating agency and has interest in the research being conducted. In most cases, the institute has been able to buy a small portion of that person's time to free them from other responsibilities so they can function effectively as a site liaison. As a result of the feasibility studies, it became clear that a more systematic process was needed to make sure that all important aspects of the program were attended to as a part of the monitoring process. Hence, a structured format for conducting annual onsite evaluations has been developed. The instrument which guides these onsite evaluations (see Appendix 2), was developed based on a number of other evaluation guides, such as the Program Summary Guide from the TADS Manual for Comprehensive Program Review (Black et al., 1984). The accreditation criteria and procedures of the National Academy of Early Childhood Programs, an evaluation system developed by the Virginia Department of Education (1984) and preschool program evaluation systems developed previously by EIRI staff for the Bureau of Indian Affairs and the Wyoming Department of Education.

Five general areas were included in the evaluation system: (a) services for children, (b) interaction among staff and children, (c) curriculum, (d) administration and management, and (e) physical arrangements. In each of these five areas, specific criteria were identified to indicate high-quality service delivery as defined by P.L. 94-142, P.L. 99-457, and current research. The evaluation guide was purposefully selective in its scope, focusing on those elements which were directly connected with actually delivering high-quality early intervention services, as opposed to important procedures such as child find, screening, and referral, which are critical for the overall program, but not particularly relevant to the research that was focusing on the effects of alternative types of intervention. Obviously, the lack of attention to important variables such as child find procedures, means that this system should only be used for the purpose for which it was designed, and should not be used as an overall program evaluation or accreditation guide.

The resulting system provides a systematic way of accomplishing three purposes. First, it ensures that all important aspects of the program will be considered in the monitoring effort of EIRI staff. Second, it provides a needs assessment instrument for EIRI and program staff to use in determining whether inservice training, or other technical assistance would be beneficial. Third, the results of the annual onsite evaluation provide a written record that is an important supplement to the other descriptive information about the program. Such information will be useful in interpreting the results of the research and in deciding how well these results generalize to other programs.

The present form of the onsite evaluation guide requires staff to consider the quality of the intervention program with respect to 27 different areas within the five broad categories referred to above. The specific items which are considered in each of these areas were selected based on a review of other evaluation and accreditation guides, review and discussion by EIRI staff members, pilot testing of the instrument, discussion with advisory committee members, and a final operational field test of the guide in conjunction with one of the longitudinal sites. As shown in Appendix 2, items from each of the other guides examined during a part of this process are well represented in the EIRI onsite evaluation guide. However, the EIRI onsite evaluation guide goes beyond any one of those guides in some areas, while not including some of the items that were considered to be tangential to the verification of experimental interventions.

Composition of the Review Team

Although the review team may be larger, it consists of at least three people with the following affiliations: (1) the director of the center which is being reviewed and/or the director's designee (often this will be the early education coordinator), (2) a parent who has a child enrolled in the center which is being reviewed, and (3) the EIRI site coordinator for that project serves as the coordinator of the review team. The team may also request that other outside person(s) with expertise in early childhood special education programs join the team.

The composition of this review team is intended to match program people with knowledge and insight about the day-to-day operation of the center with an outside person(s) who will bring a fresh perspective, assist the team in maintaining its objectivity, and accomplish most of the technical aspects of the review process including the drafting of an overall report. Members of the review team will collect data specific to each of the items under the five major areas described above. These data will come from four primary sources: (1) A random sample of cumulative folders of children participating in the EIRI research; (2) documentation which is assembled by the director from the center's files prior to the team's arrival; (3) discussion with classroom teachers (and/or other relevant direct service site staff); (4) examination of the teachers' files and daily lesson plans; (5) direct observations of intervention; and (6) discussion with the center director and other key administrative staff.

Preparation for the Onsite Visit

Prior to the arrival on site of the review team, the review coordinator will assemble the detailed site description document and a list of ID numbers of children who are participating as subjects in the EIRI research according to the format on Worksheet #1. From this list of ID numbers, the coordinator will identify those children whose records will be examined by the team during the onsite review. The coordinator will also obtain from the site a copy of any relevant needs assessment or program evaluation information which may be helpful.

The coordinator is responsible for introducing and explaining the review process to the site director, the early education coordinator, and other review team members. The coordinator will carefully explain in nontechnical terms the purpose, process, and types of outcomes anticipated to parents. The coordinator will also ensure that all team members receive a copy of the onsite evaluation guide, a completed copy of

Worksheet #1, and any other relevant materials. It is important for the coordinator to make sure all team members have the opportunity to ask questions about the materials.

The coordinator is also responsible for arranging team travel and for specifying the schedule of the site visit after conferring with team members.

Time Required for the Onsite Evaluation

The team should plan on spending one full day on-site collecting data and summarizing their observations before they leave. Some programs, especially those which consist of multiple sites, may require additional time on-site.

Site Selection

As a starting point, the team must determine at which specific sites the review will occur. For many programs there is only one site. When reviewing programs in which children are served in multiple sites, the team should consider visiting at least two sites. Sites visited should be chosen based on: (1) time constraints which usually limit the number of sites which can be visited to three; (2) sites which serve the largest number of children in the research should be a priority for visiting; and (3) sites in which treatment is suspected to be different in some important way than in other sites. Site selection should, in most cases, be accomplished prior to the team's arrive on site.

Program Summary Guide

In conducting this review, members of the team will first examine the information collected prior to the on-site review. The team will then evaluate the program by applying the criteria contained in the Program Summary Guide.

The following sections describe where and how the team will obtain the necessary information to complete the review. In order to help organize and summarize this information, the team will utilize the Program Summary Guide. The Program Summary Guide provides direction to the review process by specifying the criteria which the team will use to look at the program and provides a format for the team to summarize

SAMPLE

SCHEDULE FOR SITE REVIEW VISIT

Program: Piedmont School Dates: June 1 & 2, 1988

Review Team: Mary Turner, Coordinator
William Hernandez, Preschool Program Director
Linda Scott, Parent

June 1, 1988

9:00 - 9:30 Introduction to Staff
Overview and Purpose of Visit
Schedule Adjustments

10:00 - 11:00 Examination of Childrens' Folders with Assistance from Mary Jones and John Grey, teachers
Services for Children (A)
Assessment Procedures (A3)
Instruments (A7)
IEPs (A4)
Lesson Plans and Curriculum (A5, C1-C5)

11:00 - 12:00 Interview with Piedmont Director and Head Teacher
Services for Children

Philosophy (A1)
Criteria for Eligibility (A2)
Procedures for Transition (A8)
Administration and Management (D1)
Personnel Evaluations (D1)
Qualified Staff (D3)

1:15 - 2:00 Tour of Facility with Director

Materials and Equipment (E3, E4)
Physical Arrangements (E1, E2, E5)

2:00 - 3:00 Direct Observation in Teachers' Classrooms

Interaction Among Staff and Children (B1-B6)

3:00 - 3:30 Team Members Meet to Summarize Day's Findings

June 2, 1988

9:00 - 10:00 Parent Interview with Two Parents

10:00 - 11:00 Review Team Meeting

11:00 - 12:00 Exit Interview with Director and Other Key Staff their findings by rating each criterion. Several of the criteria contained in the Program Summary Guide can only be rated after the team has completed a worksheet which relates to the criteria in question. Most of the criteria, however, can be rated directly without completing a worksheet.

Data Sources and Data Collection Procedures

The following procedures suggest a specific sequence in which the team will collect data. The team may find it necessary or useful, however, to vary somewhat from the suggested sequence. Additionally, the team may wish to collect site data as a group and other data individually. The judgement of the team, given the unique nature of each team and each program, should guide these decisions.

After site selection has been accomplished, the team begins the review by examining and rating those elements of the program for which individual child records are relevant. To do this, the coordinator draws a random sample of about 10% of the children's folders with a minimum of 5 child folders and no more than 10. Reviews which include more than one site include an examination of a minimum of three child folders per site. Team members then interview the teacher, or teachers, who are primarily responsible for each of the randomly-selected children's programs and also rate the program based on the criteria relevant to those children. Following this, team members arrange for direct observations of intervention and/or the teaching environment. In addition to direct observation and an interview with relevant teachers, information used to complete this part of the review includes material in the teacher's files regarding daily lesson plans and other materials relevant to the students' instruction. In programs in which treatment is delivered via home visits in which parents play a major role in treatment, the team arranges for a select number of parent interviews, observations, and, time permitting, home visits.

The next step in the process is for the team members to examine any other records and documentation collected by the director or other center design relevant to the Program Summary Guide criteria.

Summarizing and Reporting Data

After examining all information including worksheets, the EIRI Program Summary Guide is completed. Using all the information available, team members summarize their overall perceptions of the program in each of the five major areas, including the identification of areas where improvement is needed. This material serves as an outline for the final report to be drafted by the coordinator. Once all of this material has been outlined, the team meets with the key staff members from the program being reviewed and share with them their conclusions about the review.

The coordinator has the responsibility to draft a final written report of the most salient data collected during the day. The other team members have an opportunity to review and approve this report, but since it will always follow the debriefing outline presented during the later part of on-site visit, it is be very unusual for the report to undergo a serious revision.

Within two weeks of the visit, the coordinator write the site review report from the visit in a draft form and send it to the other team members. The other team members should review this draft final report, making any suggestions for additions or corrections which they have. If a team member finds they are in complete disagreement with any of the conclusions of the report, they submit a brief minority report describing their dissension.

Thus far, onsite evaluations have been conducted at 10 of the 16 participating sites, and the remaining sites have been scheduled in the fall (these visits have been delayed because of slower than anticipated rates of enrollment). Results of the onsite visits have proven to be very useful for EIRI and local program staff.

III. DESCRIPTIONS OF RESEARCH SITES

As noted earlier, the Department of Education contract for the **Longitudinal Studies of the Effects and Costs of Early Intervention for Handicapped Children** calls for conducting 16 randomized studies comparing alternative types of early intervention with different groups of handicapped children. Those studies fall in three categories (i.e., six studies investigating varying degrees of intensity of intervention, five studies investigating the effects of beginning a comprehensive intervention program at various ages, and five studies investigating the effects of program variation), and have a number of similarities. The studies currently included, along with two alternate sites, were summarized earlier in Table I.1. The remainder of this section will provide a more detailed description of each of these research sites. This description will present the rationale for conducting that particular study, describe the larger organizational unit of which the collaborative research is a part, outline the subject recruitment and assignment procedures, describe the alternative types of intervention programs to be compared in that particular site, summarize the data collection and analysis activities, and detail the procedures being used to verify that the intended treatment is being implemented. The current status of each project, together with a general indication of future plans for that project, are also included.

NEW ORLEANS, LOUISIANA IVH PROJECT
Project #1 (Treatment Intensity)

COMPARISON: Grades III and IV Periventricular-Intraventricular Hemorrhage Infants (IVH) -- Treatment vs. No Treatment

LOCAL CONTACT PERSON: Ann Riall

EIRI COORDINATOR: Lee Huntington

LOCATION: New Orleans, Louisiana

DATE OF REPORT: 9-5-87

RATIONALE FOR THE STUDY: One of the major determinants of infant mortality is low birthweight (LBW). In the USA, 7.0% of all newborn babies are LBW (weighing 2500 g or less at birth), and about 1.2% are very-low birthweight (VLBW) (weighing 1500 g or less at birth). Racial groups in America demonstrate different low birthweight distributions (Blacks constitute 12.4% of total LBW babies born, American Indians constitute 6.2%) Forty percent of low birthweight infants suffer periventricular-intraventricular hemorrhages (PVH-IVH) within 72 hours of birth. These hemorrhages produce abnormal bleeding from cranial capillaries and result in different degrees of neurological damage based upon the severity of the hemorrhage (Volpe, 1981). The importance of PVH-IVH as a major health problem is underscored in the following statements:

For each 1,000 LBW infants born--

- 400 suffer PVH-IVH
- 100 of the 400 die immediately
- 85 of the remaining 300 suffer major neuropsychological impairment

Information as to the future developmental progress of PVH-IVH survivors is limited and controversial (Hynd, Harloge, & Noonan, 1984). Williamson, Desmond, Wilson, Andrew, and Garcia-Prats (1982) found that 29% of IVH Stage I and II LBW infants exhibited moderate handicapping conditions by the age of 3, whereas Papile, Munsick-Bruno, and Schaefer (1983) found that only 15% of such children could be diagnosed as having these handicaps. Both Papile et al. (1983) and Williamson et al. (1982) found that up to 80% of premature LBW survivors who experienced Stage III or IV IVH demonstrated moderate to severe handicapping conditions, such as cerebral palsy, by the third year of life.

Although there is a fair amount of research with premature low-birth-weight babies (see Bennett, 1987; Casto, et al., 1987; Cornell & Gottfried, 1976; Klaus & Kennell, 1982; Masi, 1979; Ramey, Bryant, Sparling, & Wasik, 1984; for reviews), most have focused on in-hospital stimulation or parent training as opposed to a comprehensive intervention, and virtually all have excluded children who have suffered major neurological insults such as IVH. Two recent studies which have had promising results (Als et al., 1986; Resnick, Eyler, Nilson, Eityman, & Bucciarelli, 1987) have focused on infants with more severe medical problems.

An important issue in the study of early intervention for infants with severe complications is the intensity of treatment which the infants receive. Since infants in the geographic area of this study currently receive only medical follow-up, an intervention program was designed and is provided to half the study infants on a random assignment basis. EIRI staff have worked closely with this program in the past, and thus anticipate an excellent working relationship for this longitudinal study. It provides a degree of replication of another study, but with sufficient variation in the intervention to illuminate some of the parameters regarding the optimal level of intervention program for medically fragile infants. From a systems theory perspective, it will be important to document how education, social service, and medical systems interact with each other and how each in turn affects the family system (Ramey, MacPhee, & Yeates, 1982).

PROGRAM ORGANIZATION. Previous services to handicapped infants were provided through an infant program at the human development center. This service was funded by State funds, and provided a center-based service for low-income parents of handicapped children.

The current services are provided through the Community Action for Parental Success (CAPS). CAPS provides services through a collection of community-based agencies for minority, low income, and handicapped infants. Services are offered in three phases: (1) In the hospital, while the infant is in the neonatal intensive care unit; (2) at home, once the child is released from the hospital; and (3) at a center for parent/child intervention, when the infant is older and medically stable. The current program differs from previous services in that intervention begins at birth and is provided in a multidisciplinary framework.

Full-time direct service staff for CAPS is composed of an MSW/Program Coordinator, Occupational Therapist, and Speech Pathologist/Infant Specialist. Part-time direct service staff include a nurse, nurse practitioner, paraprofessional home-visitor, social worker.

SUBJECTS: There are currently 14 children between 3 and 9 months of age (age corrected to 40 weeks to control for prematurity) who have been diagnosed by ultrasound as having experienced periventricular-intraventricular hemorrhage enrolled in the study. Subject recruitment will continue through January 1988, at which time it is expected that 40 subjects will be enrolled. The current sample is composed of 12 Black and 2 White infants from both urban and rural areas.

Demographic information on the subjects and their families has been gathered from a questionnaire and from medical discharge summaries. All of the children are from families who reside in the metropolitan area of New Orleans, Louisiana. The parents of the infants in the study represent equal percentages of single parent and two parent families. The enrolled families are predominantly low income and include some single adolescent mothers.

Criteria for Inclusion: Infants qualify for participation in the research if they have been a patient in NICUs at Charity Hospital, Tulane Medical Center, or Baptist Hospital, if they have experienced perinatal intraventricular hemorrhage (IVH) of Grades III or IV severity, and if they reside in the catchment area for treatment. Severity of IVH is divided into Grades III or IV IVH. Infants with birthweights less than or equal to 1000 g and those with birthweights greater than 1000 g are matched with infants with similar levels of IVH prior to being randomly assigned to the treatment or control group.

Procedures for Identification and Assignment to Groups: Subjects who meet the inclusion criteria are identified while in the NICU. Parents of eligible infants are contacted in the NICU and then telephone contact is made shortly after discharge. For each infant who meets the study criteria, parents must indicate willingness to participate in either the experimental or the control conditions depending upon where random assignment places them. Infants are randomly assigned to treatment or control conditions initially by a roll of a four-sided die after stratification by severity of IVH (Grades III or IV) and birthweight (under 1000 g or over 1000 g), and, subsequently, following a random sequence provided by the Early Intervention Research Institute. Parents are informed of their infant's assignment after they give approval to participate in the study.

The only person at the site who knows the actual order of eligibility and enrollment of subjects is the site coordinator.

Subject Attrition: Currently, two subjects who were enrolled have dropped out of the study. One subject moved and the other refused treatment. Intervenors and site coordinators maintain frequent contact with the families to keep current addresses and telephone numbers for the participants. When data is analyzed, attrition will be examined to determine if the dropout rate is related to experimental condition or demographic variables of the families.

EXPERIMENTAL INTERVENTIONS: The intervention package for this research project consists of select educational procedures which have been used routinely in a number of settings. The intervention package consists of three phases. These three phases are: hospital-based, home-based, and center-based.

Hospital-Based Phase: The hospital-based phase takes place at Charity Hospital and Tulane Medical Center Hospital. The purpose of this phase is to provide families of the experimental group with training in child development, interpretation of the behavior of their infant, and general child-care procedures, to reinforce teaching conducted by hospital staff, and to provide information on accessing appropriate community services such as Handicapped Children's Services. The Brazelton Neonatal Behavioral Assessment Scale (NBAS) is used to develop an individualized description of the infant to be used for parent training. The NBAS is administered by the Project Nurse, or by the Charity Nurse Practitioner. These nurses have been certified by staff from Boston Children's Hospital in the administration of the NBAS.

Home-Based Phase: The second phase of the project begins after NICU discharge, and consists of home-based early intervention conducted cooperatively with an existing Kingsley House (a century-old social service agency) home-based parent training program for low-income mothers. The purpose of this phase of the program is to provide the infant's family with follow-up training on the proper care and handling of the infant. The infant is assessed, and an Individual Family Service Plan (IFSP) is developed in cooperation with the parents. Treatment objectives are determined in the areas of the infant's and family's greatest needs, but typically include objectives from the motor, self-help, receptive language, and social-emotional areas. The treatment program is delivered by the parents.

The primary intervenors, in addition to the parents, are a paraprofessional home visitor and the case manager. The transdisciplinary team provides regular input on family and child progress, and consultation in their areas of specialty when needed.

Each family is scheduled for a weekly one or two hour home visit. Simple, practical programs are left with the principal caregivers each week, and performance is monitored through an observation checklist each week.

Center-Based Phase: The third phase of the intervention consists of a center-based early intervention program conducted with the Urban League Parent/Child Center program. Project staff provide specialized educational intervention and parent training for project participants. At this point, child-oriented goals and objectives begin to outweigh family goals and objects on the IFSP. The Louisiana Curriculum for Infants with Handicaps (used for 5 years by the Human Development Center) guides the development of child-oriented goals and objectives. Specific activities are adapted to fit the schedule of activities at the Urban League Parent Child Center in order to provide as normalizing an environment as possible for project participants. Each child spends approximately 2 hours per day 5 days per week at the center. In the center-based program, intervention services are delivered by an intervention team consisting of an occupational therapist, speech pathologist/ infant specialist, and social worker. A member of the team serves as case manager.

Each of the intervention phases is driven by an Individualized Family Service Plan which is developed by the transdisciplinary team. One of the full-time staff is designated case manager. The case manager can, therefore, be an occupational therapist, speech pathologist,infant specialist, or social worker. Representatives from each of the collaborating agencies are involved in the development of initial and follow-up IFSP goals, objectives, and activities. The case manager is responsible for assuring that direct service as well as referral objectives are met.

The IFSP is a dynamic document which changes as the infant and caregivers move through the three phases of the project (i.e., hospital-based, home-based, and center-based). A family-oriented curriculum matrix focusing on domains of Specialized Care, Sense of Self and Environment, Physical Abilities, and Problem

Solving and Relationship Abilities guides the development of goals, objectives, and activities during Phases I and II. At the beginning of Phase III (or at approximately three months corrected age), an interdisciplinary evaluation is conducted following state guidelines, and child-oriented goals and objectives are generated in addition to the family-oriented goals in process.

Individual family and child activities are designed to be integrated into the normal daily activities of the families. The four curriculum domains are cross referenced with routine daily activities such as feeding, dressing, and playing. Traditional developmental domains such as communication, positioning and handling, cognitive, gross and fine motor, are integrated into these routine activities throughout each of the three phases.

TREATMENT VERIFICATION: A number of procedures have been implemented to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data: Home visits, clinic/agency visits, telephone contacts are recorded using a cumulative Monthly Contact Summary Sheet. Cancellations and hospitalizations are also noted.

2. Intervention reporting forms: IRFs are completed each time a team member interacts with a participant family (or attempts interaction). The IRF includes documentation of Intended Learning Outcome, Actual Learning Outcomes, and Infant Status.

3. Interventionist data sheet: This direct observation data collection form is completed on a probe basis by an intervenor. The target performance may be either caregiver or infant performance.

4. Site review: A formal site review will be conducted annually.

SITE REVIEW: A site review is scheduled for September, 1987. The purpose of this review will be to collect information about the nature and quality of early intervention services being delivered. The site review will also provide verification as to whether or not the research conducted at this site is implemented as intended, and will provide needs assessment data which may be useful to site administrators.

The site review will be conducted according to the treatment verification process described in the Treatment Verification Handbook for Research Sites (EIRI, 1987), according to the procedures described in the Guide for Site Reviews of EIRI Research Sites, which is found in Appendix A of the handbook.

DATA COLLECTION: Data is being collected for this project to determine the effect of early intervention upon the child and the family. The assessment instruments were chosen to provide consistency of data collection between sites. However, some assessment instruments were chosen for this project to assess child and family variables unique to early intervention with infants suffering Grade III and IV intraventricular hemorrhage.

Pretest: At 3 months corrected age (prematurity corrected to 40 weeks plus 3 months) all infants are tested with the BDI, the Movement Assessment of Infants (MAI) and a neurological assessment. The parents complete the Parenting Stress Index (PSI), the Family Support Scale (FSS), the Family Resource Scale (FRS), the Family Inventory of Life Events and Changes (FILE), and the Family Adaptability and Cohesion Evaluation Scales (FACES III). The BDI is administered by a trained diagnostician who is unaware of the infant's group assignment. Test and questionnaire protocols are sent to the site coordinator for scoring and placement in a data file. A duplicate set of the data is sent to EIRI. Parents are paid $20 for their time in completing the evaluation session. The pretest assessment battery provides information about the child's early developmental status and neurological functioning. In addition, family measures provide information on family reaction to the newborn, parent stress, and family support systems.

Interim Testing: When infants are 6 months corrected age, their parents are mailed the Carey Infant Temperament Scale to complete. This questionnaire is returned directly to the site coordinator via postpaid mail. Parents are paid $10 for their time in completing the questionnaire.

The Carey Infant Temperament Scale assesses the parents' estimate of the infant's temperament at 6-9 months of age. Scoring categorizes the infant's temperament as easy, intermediate, slow-to-warm, and difficult. The parents' rating of the child's temperament is compared with information obtained in ratings of parent/child interaction videotapes taken during posttesting.

Posttest: Posttesting occurs at 12 months corrected age and annually thereafter. The posttest battery is administered by a diagnostician who is "blind" to the subject's group assignment. The child is given the BDI and the parent completes the PSI, FILE, FACES III, FSS, FRS, a survey of additional services received by the child in the last year, a report of child health during the last year, and a parent socioeconomic survey. Parents are paid $20 for completion of the evaluation. Additional measures taken at 12 months corrected age are videotapes of mother-infant interaction and one of motor development completed by a trained child development specialist or licensed physical therapist. Parents are paid $10 as an incentive for videotaping.

The videotape of motor functioning follows a specific script. The motor script has the child perform the following behaviors (based upon the child's level of motor development): reaching and grasping from a supine position, rolling over and reaching and grasping from a prone position, creeping and crawling, sitting and reaching, pulling self up to stand, walking, and squatting to pick up a toy.

The parent-child interaction videotape records the parent and child in play activities. In the first section, the mother and child play together for 15 minutes "as they would at home." Then for one minute the parent encourages the child to put the toys away. For the next two minutes, the parent reads to the child. Then the parent leaves the room for 45 seconds, and taping continues for two minutes after the parent returns to the room.

The posttest data provides information regarding the effect of early intervention upon the infant's development and the impact upon the family. Changes in family stress, resources, and socioeconomic status over time will also be assessed. The rating of mother-infant interaction will be compared with other outcome and family measures and the relationship of infant temperament to quality of parent-infant interaction will be assessed.

Assessment Management: Four local diagnosticians have been trained to administer the pre- and posttest measures. The diagnosticians have master's degrees. Testing is scheduled directly with the diagnostician by the site coordinator. Shadow scoring of 10% of test administrations is conducted by another trained diagnostician. Interrater reliability data reveal an average coefficient of .88.

DATA ANALYSIS: Since only 14 infants have been enrolled in this study so far, meaningful analyses cannot yet be accomplished. Plans for data analysis include assessment of group differences on developmental, neurological, and family measures. Differences at pretest (if any are found) will result in the use of the appropriate measures as covariates in the posttest analysis to determine the effectiveness of early intervention services.

As data are collected, it is being coded and checked for errors. Data preparation is ongoing to facilitate ease of analysis once all pretest and posttest data are available.

FUTURE PLANS: Enrollment of PVH-IVH infants will continue until January 1988 or until 40 infants have been enrolled. A research proposal has been submitted by LSU staff to investigate language development in this sample. If the project is funded, the following language measures will be added:

Auditory Brain Stem Evoked Response
Preferential Looking Visual Evaluation
Acoustic Babbling Evaluation
Expanded Mother-Infant Interaction

LOUISIANA STATE UNIVERSITY MEDICAL CENTER
HUMAN DEVELOPMENT CENTER
(LSU/VI)
Project #2 (Treatment Intensity)

COMPARISON: Visually Impaired Children -- Weekly parent-infant sessions versus twice-monthly parent group meetings.

LOCAL CONTACT PERSON: Judith Holt, Louisiana State University Medical Center

EIRI COORDINATORS: Stacey Mott, Diane Behl

LOCATION: New Orleans, Louisiana

DATE OF REPORT: 9-4-87

RATIONALE FOR THE STUDY: This study of early intervention for visually impaired infants and toddlers compares the long-term effects of intensive once per week parent-child sessions to a contrasting lower intensity treatment of twice per month parent group meetings. The importance of vision in early development is crucial, as demonstrated by experts in the field such as Fraiberg (1977), Barraga (1986), Warren (1977), and Ferrell (1986). By age three, infants with visual impairments often demonstrate socio-communicative and cognitive delays that are quantitatively and qualitatively different from their sighted peers (Ferrell, 1986; Warren, 1987). Ferrell (1986) stated that all of these secondary handicaps are preventable; they occur because there has not been sufficient, systematic intervention given to the child and his/her family.

Visual impairment also causes a disruption in the interaction between the caregiver and child. Als (1983) observed that the infant with visual impairments signals and communicates differently. These signals are often distorted and difficult to interpret, making positive, constructive interaction even more difficult for parents who often are attempting to cope with the emotions of having an infant with a handicap. Rowland (1984) summarized the findings of researchers involved with visually impaired children by stating "the importance of appropriate exchanges between mothers and infants cannot be overstressed." This highlights the importance of involving parents in the intervention process.

Though researchers speculate that intensive intervention for both child and family is necessary, there is a dearth of hard data regarding the intensity with which this intervention should be provided. Little data can be found to assist in answering the question of how to provide the best intervention (White, Bush, Casto, & 1986). Though the importance of early intervention for children with visual impairments and their families has been documented in the literature, few controlled prospective studies have been completed on children with visual impairments, especially at the infant and toddler levels.

Since 1969 seven studies having clear experimental designs and appropriate outcome data have been conducted with visually impaired children in an attempt to provide some degree of objective information on the effectiveness of early intervention (Adelson, & Fraiberg, 1974; Allegheny County Schools, 1969; Bregani et al, 1981; Fraiberg, 1977; O'Brien, 1976; Olson, 1983; Rogow, 1982). Though these studies reported that the treatment had a substantial positive effect on the children, it was not always clear from the description of the intervention what specific strategies were implemented. Additionally, the studies did not utilize randomized assignment to a control group; the visually impaired subjects were typically compared to normally sighted peers or a blind comparison group from a previous study. This study provides an opportunity to improve upon these research designs, whereby random assignment of a matched sample of visually impaired children will provide an appropriate comparison group. This study will also clarify the conclusions as to what effects are due to the treatment as opposed to other confounding variables.

There is a dearth of information concerning long-term effects of treatment. Though five of these seven studies had interventions that were at least one year in duration, there is little if any information regarding long-term effects of the treatment. Since the LSU/VI study will be collecting outcome data for several years following the treatment, it will provide some needed information concerning long-term treatment results.

Exemplary services designed for children with visual impairments have generally been described as needing to be comprehensive in nature, providing systematic instruction to the child as well as providing parents with instructional strategies and support. Again, the best-noted efficacy studies have not always provided clear descriptions of their interventions. More specificity, i.e. parent training techniques, would increase the value of studies as well as increase the ability to replicate the techniques (Guralnick & Bennett, 1987). Separating treatment variables to determine which factors or combination of factors are the most beneficial would, therefore, be extremely valuable to the field. This controlled study comparing a well-designed treatment serving both parent and child with a control condition of lower intensity serving only the parent directly will add greatly to the knowledge needed to respond to the aforementioned questions. The collection of treatment verification data will provide specific information facilitating replication of any effective treatments.

From a systems theory perspective, this study offers an interesting contrast and will help answer the question of how the program, family and infant systems interact. In particular, in order to have an impact on the infant system, is it necessary to interact directly with the infant or is it possible, or even preferable to have contact through the parent who is the most salient outside system in the infants environment? Because the parents and infant already exist as a family system, it may well be that intervention should be as subtle and unintrusive as possible, in order not to disrupt this developing system. On the other hand, more intensive, direct, and concrete intervention provided to the parent and infant may be more effective simply because of its direct nature. Furthermore, the family system may already be disrupted due to the infant's handicap and this added support may not be a burden to the family system but a support instead.

This is also a worthy study from an economic perspective. The intensive program is much more expensive, but it is consistent with "best practices" and will thus provide a good investigation of cost-benefit ratios when compared to the low-intensity control group. Cost-benefit information can be separated to analyze the cost-benefit ratios for effects in child growth as well as impacts on the family. For instance, the low-intensity twice-monthly parent group may be found to create greater positive benefits on family functioning when compared to the high-intensity weekly individualized treatment group.

PROGRAM ORGANIZATION: This study is conducted in collaboration with the Human Development Center (HDC, a University Affiliated Facility) at Louisiana State University in New Orleans. Funding for the HDC is provided in part from the Department of Education, Office of Special Education and state and local sources. The LSU/VI study is funded by the Louisiana Office of Education and is directed by Dr. Judith Holt, who is a certified teacher of the visually impaired with extensive experience in service provision and research. Further staff include a home visitor and consulting services by therapists at the HDC. The program is new and provides services to visually impaired children and their families who would otherwise receive no services.

The geographical area served includes the city of New Orleans and that area within a 60 mile radius of the city. Current services for visually impaired children 0-3 years are limited to programs that serve developmentally delayed or private motor and/or speech/language therapy. There is no other program in the area that provides programming specifically to meet the needs of children who are visually impaired.

Collaboration also exists with the LSU Eye Center which is particularly advantageous since this is one of the top three centers for pediatric ophthalmology in the country, if not the world. The Eye Center assists in the identification of potential research subjects as well as providing sophisticated information regarding various aspects of the subjects vision, i.e., acuity, perception, and discrimination.

SUBJECTS: Twenty-two children have been identified and randomly assigned to groups. Table III.1 contains descriptive data on the subjects in each group. It is estimated that fifty children 36 months of age or younger will be randomly assigned to treatment groups. The population from which children are being drawn is about 50% black and has a high degree of variability with respect to socioeconomic status. All subjects are being tested for visual acuity (to ensure they are appropriate for this study) by the LSU Eye Center, which is one of the top three centers in the country for pediatric ophthalmology. Children are being stratified on visual acuity and developmental level/severity of handicap prior to assignment. Since services for children ages birth to three are very difficult to obtain, the study is limited to enrolling subjects less than 36 months of age in order to meet the needs of the community.

Criteria for Inclusion: Subjects are being identified through referrals from the LSU Eye Center and from pediatricians and ophthalmologists in the New Orleans area. Children who are identified are screened by either the site coordinator or the teacher and social worker hired for the study. Each child is classified according to visual acuity, presence of other handicapping conditions, and developmental level as follows.

Visual acuity: 1 = blind
2 = severely impaired with correction
3 = mildly or moderately impaired

Handicapping condition: 1 = no other handicapping condition
2 = presence of one or two mild handicaps
3 = more than two mild or severe handicaps

Table III.1

LSU/VI Group Comparisons on Pretest Variables

Variable	Weekly Individual Treatment (Control Group)			Twice-Monthly Parent Group (Experimental Group)			T-test Probability
	mean	(SD)	n*	mean	(SD)	n*	
Acuity	2.50	(.85)	10	2.11	(.93)	9	.356
Severity (Handicapping Condition & Developmental level)	3.00	(1.41)	10	3.67	(1.50)	9	.335
Parenting Stress Index Total Score (Mother)	221.00	(53.45)	6	223.25	(31.03)	8	.929
Mother's Education	13.00	(1.53)	7	13.00	(3.02)	8	1.000
Family Support Scale Total Score (Mother)	33.83	(10.17)	6	29.75	(12.81)	8	.519
Family Resource Scale Total Score (Mother)	133.83	(12.77)	6	110.75	(28.26)	8	.067
FACES III Discrepancy Total Score (Mother)	9.17	(5.04)	6	6.75	(10.21)	8	.573
FACES III Cohesion	42.67	(4.89)	6	41.00	(6.16)	8	.583
FACES III Adaptability	23.50	(6.50)	6	24.13	(8.56)	8	.879
FILE Total Score Past 12 Months (Mother)	10.33	(8.45)	6	9.88	(6.56)	8	.915

* Data on new subjects were not yet available

NOTE: On the PSI and File, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and adaptability scores indicate greater amounts of these factors.

Developmental level: 1 = no more than a 33% delay in motor or socio-communication/cognitive areas
2 = more than 33% delay in either motor or socio-communication/cognitive areas
3 = more than 33% delay in both motor and socio-communication/cognitive areas

The identification of a handicapping condition is based on clinical judgement of qualified motor therapists and/or communication disorders specialists. Developmental level is obtained through the use of a screening instrument that consists of selected items from the Early Intervention Developmental Profile.

Extensive discussion occurred in the spring of 1987 regarding the types of children to involve in the VI study. Initially, all children with visual impairment, regardless of the severity of other handicapping conditions, were included in the study. Later, a decision was made by the LSU/VI site liaisons and EIRI staff that the subject pool would be limited to children who are primarily visually handicapped. Children are now eligible for inclusion in the study if the vision impairment is the major disability and the delays are due primarily to their vision impairment. Children who have more than two other handicapping conditions and who have more than a 33% delay in both motor and socio-communication/ cognitive areas are not be eligible for enrollment in the study. Therefore, subjects receiving a handicapping condition and developmental rating of "six" would be excluded from the study. The original subject pool (prior to March 20) only contained one subject who was disqualified using these new criteria. This child has since been dropped from the study, though he continues to receive services.

Generally, subjects that are recruited are not involved in other programs for children with disabilities. It is possible for subjects who have received prior services to be enrolled in the study. However, given that random assignment procedures are used, any subjects who have received services in the past should be balanced across both groups. It is possible that children who have received prior services may continue to be enrolled in some circumstances if they moved to the New

Orleans area from another geographical region where services were provided. Again, random assignment should ensure that these subjects are balanced across both groups.

Procedures for Identification and Assignment: After receiving a signed informed consent form from parents, children are randomly assigned to groups based on visual acuity and a combined score for handicapping condition and developmental level. This results in a six-cell assignment matrix as follows:

Visual Acuity

		1	2	3
Handicapping Condition	2			
and	3-5			
Developmental Level Rating	6			

On February 13, 1987, those children who were identified during screenings in the first two weeks of February were rank-ordered by age within the cells. The random assignment pattern was determined for each cell by a computer-simulated four-sided die. Children were assigned based on this pattern within cells. Children who were identified after that date were placed in the appropriate cell and assigned according to the assignment pattern.

Subject Attrition: Two children have been dropped from the study, one due to chronic health impairment, the other due to dramatically improved vision on follow-up, which disqualified her from study participation. There are thus 20 active subjects to date.

EXPERIMENTAL INTERVENTIONS: The two treatments for 0 through 36-month-old subjects consist of weekly individualized home-based intervention compared to twice-monthly parent group meetings. A detailed description of the treatments follows.

Weekly Individualized Treatment

Treatment for 0- through 36-month-old subjects consists of parent-infant training sessions in which parents or primary caregivers are given a structured program individualized to meet the needs of the family as well as the child.

All infants/toddlers in the individualized treatment group are scheduled for 1 hour of intervention services weekly. Generally, intervention services are provided in the child's home. Daily routines, such as feeding, diapering and changing, and familiar toys and household items are incorporated into the activities. In two instances, it has been necessary for the parent to bring the child to the program center for intervention services. The travel expenses for both families are defrayed through program funds. One child is attending a regular day care center, 5 days a week, and the program teacher provides services there. Meetings are held between program staff, day care staff, and the parent to discuss and plan strategies and exchange feedback. All parties are pleased with this pattern of service delivery which is, in fact, the most natural setting for this child.

Role/Needs of the Family. Every effort is made to involve the parents/family in activities designed for the child. The caregiver actually involved in the sessions varies according to the lifestyle of the family. With some families, the role of caregiver varies among parents, grandparents, babysitter, and preschool teacher. In any event, the person with primary caregiving responsibility for the child at the time is an active participant in the session.

In instances in which a parent is not the primary caregiver during program intervention sessions, every effort is made to share information with them in telephone contacts and other visits. The degree of caregiver involvement in any one session is individualized according to the needs and skills of the caregiver. The role of the intervenor may be assumed almost entirely by the caregiver, with the program teacher guiding and giving feedback. In other instances, the program teacher may demonstrate while the caregiver observes. In most sessions, there is a combination of these patterns. New activities are generally first introduced by the program teacher, who then instructs the caregiver in implementing the activity. Parents are involved in collecting data and charting behavior in the home between sessions.

In addition to focusing on specific need of the individual infant/toddlers, the needs of the family in relation to the child are addressed. Treatment reflects the family's needs in regard to interacting with the child, developing their general knowledge of visual impairments, and improving their skills in encouraging their child's development. Needs for assistance or guidance in obtaining community services such as medical or day care services for their child are also addressed.

Curriculum. The Louisiana Curriculum for Infants with Handicaps, which was developed by the Staff of the Human Development Center, forms the basis for development of intervention activities for this program. The activities in the curriculum take into account the total child and the interactive nature of development across domains.

Individual activities (lessons) have been developed for the domains of gross motor, fine motor, cognition, self-help, social-emotional, and communication. Information with each lesson includes: area, goal, rationale, materials, cautions, teaching procedures, teaching notes, and evaluation criteria. A data collection sheet is available for use by parents and program staff.

A Curriculum Placement Instrument (CPI) for each domain was developed in conjunction with the curriculum and serves as the means for choosing activities appropriate for the status of child and family. Modifications are made in specific activities in the curriculum, in consultation with the professional staff, in order to adapt them to individual child's needs and as appropriate for the child's vision.

In addition to the observation and modeling provided by the program teacher, parents are provided written instructions on how to implement a specific lesson and the type of weekly data to be collected. Oftentimes parents request a need for information on a particular topic related to visual impairment or child development. The home intervenor provides supplemental information from the Reach Out and Teach curriculum. This is a manual designed to provide parents with information about visual impairments and appropriate general stimulation activities.

Staff Roles. The program teacher is the primary service provider working closely with the parents or other caregivers. The program teacher plans sessions and activities, guides interventions, collects data, maintains attendance records and individual child workbooks, and coordinates consultations and direct services from other professionals. The program teacher's qualifications consist of a master's degree and certification in communication disorders, extensive clinical and treatment experience with severely handicapped infants and children, and consulting as a program evaluation specialist.

The speech therapist, occupational therapist, physical therapist and social worker at the Human Development Center are available to assist in meeting needs of the infants/toddlers and their families enrolled in this program. All children are seen, initially, by at least one of these specialists in the screening process. Depending upon the impairments of the child and needs of the family, the specialists are called upon for consultation with the program teacher and/or parents, or for provision of direct services. For example, the speech therapist assists the program teacher to design a feeding program; and the OT and PT consult and provide direct services for several children with gross and fine motor problems; and the social worker assists the program teacher in helping a family with interpersonal problems to obtain social services.

Twice-Monthly Parent Group

Families in the low intensity control group receive services in the form of group meetings which are held every other week for approximately one hour. The meetings are planned and implemented by a professional with a master's degree in social work. Although informal, they always have a specific topic for discussion, with readings assigned and time for questions and answers. After an introductory meeting, appropriate professionals attend the meetings to discuss cognitive development, social skills and temperament. Presenta-tions have focused on the effects of visual impairment on these various areas of development with general suggestions for compensation. General stimulation activities are suggested, but no individualized treatment plans or activities are provided. Slides and tapes developed for use with Reach out and Teach have also been used.

After each presentation by a professional, parents have time to ask child specific questions and discuss issues of concern to them. Discussion has been generated by the Reach Out and Teach books. For example, the differences among the visual impairments of the children whose parents attend the group meetings may be a topic of discussion. These sessions also function as a support group, whereby parents with older children who are visually impaired may offer support and information to the parents of younger children.

Additional Services. Given this treatment intensity design, it is important to be aware of any possible additional services that subjects may be receiving. There are no other services available in the study's geographical area designed to specifically treat children who are visually impaired. However, there are other services available for children with developmental delays. Parents can hire motor and/or communicative disorders specialists, though this is expensive. The Children's Hospital can also provide such therapies to families who receive public assistance. There are also other infant programs, though these do not specialize in serving visually impaired children. The center-based program at the Human Development Center is an exemplary program that serves children with severe handicaps. However, the program only serves a total of 15 children due to their emphasis on research and personnel preparation.

Subjects who have been enrolled in the individualized parent-infant group for 12 months and who are at least 18 months of age have the option of switching from the home-based program to the HDC center-based program, provided that there are openings. This involves two 2-1/2 hour sessions at the center, requiring the parent to spend one session per week working with the staff and their child. Parents of subjects meeting the criteria may also elect to serve their child in another type of preschool rather than the HDC Program. In such instances, the weekly home visits will continue to be conducted. Such additional services will not be encouraged for subjects in the twice-monthly parent group condition.

Generally, parents are not prohibited from obtaining additional services, though it is important to maintain a clear distinction between intensities of the two groups. For example, it was discovered that one child from the twice-monthly parent group was also receiving services two days per week in the HDC program. This subject was later dropped from the study due to the fact that upon routine reassessment of visual acuity, there was marked improvement and the child was no longer visually impaired. It has since been made clear to the site liaisons that such dual treatments for the group condition are not encouraged by the staff. The completion of the additional service form, described in the treatment verification section, provides this needed information to monitor additional services.

TREATMENT VERIFICATION. A number of procedures have been implemented in order to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data. The parent and child's participation in the individual sessions, as well as the parent's involvement in the group meetings, is recorded according to the length of the session and the staff involved. Non-attendance at regularly scheduled sessions is also recorded

according to the reason for non-attendance (e.g., child illness, holiday, etc.). Results of attendance data reveal that attendance for both the high intensity and the low intensity group varies from 25% to 100%. This information will be helpful in analyzing data and interpreting results.

2. Parent report of time. Information regarding the amount of instructional time each parent reports spending with their child is collected from parents involved in the high-intensity, weekly individualized treatment group. These data are recorded on a summary sheet and sent to the site coordinator on a monthly basis. Since parents from the low-intensity, twice-monthly group condition are not provided with specific instructional plans to be followed, data are not collected from this group in this manner. However, parents from the low-intensity group will be asked four times at random for an estimate of how much time they spent during one week doing instructional and general stimulation activities.

3. Additional Services. Parents will provide information via a written form regarding any services that may have been obtained outside of the research program during the past 12 months of intervention. This information will be useful in verifying whether or not the effects are due to the intervention being studied.

4. Parent Satisfaction and Quality of Parent Involvement. Given the important role that parents play in receiving services and providing services to their children, rating scales have been developed to record parent's satisfaction with the services they are receiving based on their group assignments as well as the service provider's impression of the parent's levels of knowledge, attendance, and support. Both forms are completed at posttest time. All obtained information is kept confidential.

SITE REVIEW. A formal site review is conducted annually. While site visits have been made to the program (most recently on March 4, 1987, and with a return visit by LSU staff to USU on April 2), a formal site review has not yet been conducted, but it is planned for October, 1987. This review will incorporate the procedures given in the "Treatment Verification" chapter. The purpose of this site review is to obtain quantitative and qualitative data for both the high and low intensity service groups and for the LSU staff. Any need for technical assistance will also be determined.

DATA COLLECTION: Data on children and their families are being collected using instruments that will yield descriptive information (i.e., demograhpics) as well as assessing treatment effects. The majority of the instruments are ones that are consistent across all sites, however, posttest data will be collected using complementary measures selected to meet the unique characteristics of this visually impaired population.

Pretest. After children have been identified and assigned to groups based on their visual acuity and screening results, a pretest battery consisting of the Battelle Developmental Inventory, Family Support Scale (FSS), Family Resource Scale (FRS), Family Inventory of Life Events, and Changes (FILE), and the Family Adaptability and Cohesion Evaluation Scales (FACES III), is administered. Demographic information is also obtained via interview with the parent. These measures will be used as covariates in the analysis and will be used to investigate whether certain types of families or certain types of children profit more from intervention.

The BDI is administered by a trained diagnostician who is unaware of the child's group assignment. Testing occurs at the Human Development Center in New Orleans, ensuring that the testing setting is the same across all subjects.

The family measures are completed by the parent attending the testing session following the administration of the BDI. Married parents and those with spouse equivalents are also given a copy of the FSS to take home for their partner to complete. In order to encourage and reinforce parent participation in the assessment process, parents receive a monetary incentive of $20 for completing the pretest battery. The diagnostician scores the BDI and completes a testing report. The diagnostician does not score the family measures. All data is then transmitted to the assessment supervisor. The assessment supervisor maintains copies of all of the protocols for the on-site records and submits the original protocols via certified mail to the EIRI site coordinator within one week. Table III.2 summarizes the pretest scores.

Posttest. Posttest measures will be collected after children have been in the program for 12 months, and will consist of the Battelle Developmental Inventory and

Table III.2

LSU/VI Group Comparisons on Pretest BDI Raw Scores

Variable	Weekly Individualized Treatment (Control Group)			Twice Monthly Parent Group (Experimental Group)			T-test Probability
	mean	(SD)	n	mean	(SD)	n	
Personal Social	40.14	(24.38)	7	35.67	(29.28)	9	.744
Adaptive Behavior	31.14	(21.47)	7	25.22	(20.69)	9	.588
Gross Motor	31.86	(21.10)	7	20.78	(17.80)	9	.287
Fine Motor	15.00	(11.41)	7	11.78	(10.64)	9	.574
Motor Total	46.86	(31.91)	7	32.56	(28.26)	9	.368
Receptive Communication	12.14	(6.52)	7	9.56	(6.29)	9	.438
Expressive Communication	14.86	(11.68)	7	11.78	(12.73)	9	.623
Communication Total	27.00	(18.02)	7	21.33	(18.73)	9	.550
Cognitive	16.86	(11.07)	7	12.33	(9.94)	9	.413
Battelle Total Score	162.00	(105.44)	7	127.11	(104.65)	9	.522

* Data on new subjects were not yet available

the various parent questionnaires mentioned above. In addition, a parent satisfaction with treatment questionnaire and a report of child health will be administered on a posttest basis only.

Complementary measures under consideration include the Peabody Mobility Scales, the Uzgiris-Hunt Scales, Assessment of Preferential Looking, and two videotaped assessment procedures. The Peabody Mobility Scales were chosen as a measure of the visually impaired child's ability to move above and explore his/her environment. The Uzgiris-Hunt Scales, based on Piagets' theory of cognitive development, was selected to reflect expected gains in conceptual skills.

Assessment of Preferential Looking was chosen to assess visual perception in children, a variable that can be effected by treatment. Videotaped assessment of parent-child interaction will record the effects of visual impairment on parent-child relationships. A standardized procedure for assessing attending, skills exploration, and interaction with the environment will also be used since these skills are primary importance for this population.

Assessment Management. Four diagnosticians have completed the extensive training requirement prior to administering the pretest measures. All of the diagnosticians have master's degrees and extensive experience testing and assessing handicapped infants and children. All the testers are naive to the subject assignment as well as to the details of the study. Interrater reliability data reveal an average coefficient of .87. Dr. Judith Holt, a specialist in the area of teaching children with visual impairments, fulfills the role of assessment supervisor in regard to the monitoring of the Battelle, and checking all protocols for completeness. Shadow scoring of 10% of the test administrations is conducted by the assessment supervisor or another certified diagnostician.

DATA ANALYSIS: Results of the pretest data analyses conducted thus far are presented in Tables III.1 and III.2. Table III.1 presents descriptive data on the children and families and Table III.2 presents Battelle pretest scores. Pretest demographic data and treatment verification data will be used to control for differences in both family demographics and the quality of the intervention between the two groups. Outcome data will be collected on each subject after receiving 12 months of treatment. Other important variables to be analyzed in relation to the child and families measures include the child's severity of visual impairment and the occurrence of other handicapping conditions. Cost data will be collected when enrollment reaches twenty-five to thirty subjects.

FUTURE PLANS: The two treatment interventions will continue until spring of 1990 and enrollment will continue until the sample size reaches 50. No changes in the treatment procedures are anticipated at this time. However, the findings of the site review in October may result in recommendations for technical assistance. As children grow older, the staff at the Eye Center of LSU Medical School plan to use different age-appropriate complementary measures to assess children's growth. Cost analyses data will continue to be collected while the treatment is being implemented.

ALABAMA INSTITUTE FOR THE DEAF AND BLIND
Project #3 (Treatment Intensity)

COMPARISON: Hearing Impaired Children -- Two, 1/2 days per week of center-based services vs. five, 1/2 days per week of center-based services.

LOCAL CONTACT PERSON: Phyllis Mayfield, Regional Director, Parent-Infant Program

EIRI COORDINATOR: Bob Rittenhouse, William Eiserman (Utah-based Coordinator)

LOCATION: Talladega, Alabama (research will also be in Auburn, Dothan, and Tuscaloosa)

DATE OF REPORT: 9-4-87

RATIONALE FOR THE STUDY: Language learning does not occur as spontaneously for deaf children as it does for hearing children. While the learning of language by deaf children is complex in and of itself and only a small percentage ever gain control over it, they also are at a disadvantage in gaining knowledge about the world, internalizing and organizing experiences and placing those experiences in appropriate contexts. For them, specialized instruction and intervention is often necessary. The field of deaf education has developed a number of intervention approaches to address the needs of deaf children including alternative communication, auditory training techniques, and learning experiences to provide them with experiences as similar to those of hearing children as possible. These experiences are provided in a more deliberate fashion, are carefully planned and monitored, and subsequently revised. As the field of deaf education has evolved, several assumptions have been made about how to address the needs of young deaf children. One of those assumptions is that the more time spent by deaf children in a carefully planned, focused and deliberate intervention, the more progress hearing impaired children will make toward overcoming their disability and gaining control over language as well as developing cognitive and social skills.

What little research does exist regarding the effects of early intervention with hearing impaired children has focused primarily on curriculum comparisons or family dynamics and has employed pretest-posttest designs (Craig, 1964; Greenstein, 1975; Horton, 1976; Prinz & Nelson, 1984; Utah School for the Deaf, 1972). Cost data are essentially unavailable. Well-designed research studies examining alternatives in treatment intensity for hearing impaired children are lacking attention. Furthermore, service providers, such as the staff of the AIDB, do not believe that the current level of services of 2 half-day services per week is sufficiently intensive to make optimal progress toward meeting the needs of hearing impaired children. The "more is better" assumption has not been empirically established, however. Therefore, in order to most confidently meet the needs of young hearing impaired children, the field of deaf education must ask the critical question, "Is more better?"

Since the current level of services at AIDB is minimal, and since expanded services can feasibly and ethically be augmented with the support of this study, this setting provides an excellent opportunity for assessing the effects and costs of two different intensities of early intervention services to hearing impaired children.

PROGRAM ORGANIZATION: The Alabama Institute for the Deaf and Blind project serves hearing impaired children between birth and 5 years of age throughout the state of Alabama. Under the auspices of AIDB, eight state-wide regional centers have been created to serve children. Three of these regional centers, including Auburn (east central Alabama), Dothan (southeast Alabama), and Tuscaloosa (west central Alabama), have been selected to provide settings and subjects for this study because they have histories of child referral rates which indicate that a sufficient number of subjects will be identified who will qualify for the research study. Presently, services are being provided 2 half days per week in each of the regions.

A maximum of two centers will be used in each region for providing the actual services to the children. As would be expected, each location has its own idiosyncracies. Together they share the mission of preparing children and families for traditional public school programs for hearing impaired children by means of early attention to auditory stimulation, communication development and psycho-social adjustment. Any disparities in program functioning is negligible to the research, but will, nevertheless, be closely monitored by means of the treatment verification procedures which will be outlined in a subsequent section of this site description. Each of the research locations is coordinated by specialists who work directly with the project coordinator at AIDB. All communication between research locations and EIRI is channeled through the project coordinator at AIDB whose responsibility is to oversee the research with respect to all agreements made with EIRI concerning the nature of the treatment, assignment of subjects, testing and all other procedures.

SUBJECTS: There are currently 29 children between 1 year 6 months and four years seven months (mean 2 years 10 months) identified for the study and they have been assigned to groups for purposes of the study. The average hearing loss is 82 dB in the better ear which reflects a range of 70 to 95 dB losses for the sample. Descriptive data for currently enrolled subjects are presented in Table III.3 according to the stratification variables.

Table III.3

Descriptive Data According to Stratification Variables for Currently Enrolled Subjects

	2-3 years	3-4 years
50 - 70 dB	n = 10	n = 5
70 > dB	n = 6	n = 8

By fall of 1987, 50 two- to four-year-old children with moderate to profound hearing losses (unaided pure-tone scores of 50 dB or greater in the better ear across the speech range) will be randomly assigned to the two treatment conditions after stratification by age and degree of hearing loss. The population to be served is in mostly rural areas with a range of socioeconomic variability, of which about 50% are Black. Very few services are conveniently available for rural families except for those offered through AIDB. Children travel no further than 40 miles round-trip to and from the existing service centers or the newly-developed geographically-accessible satellite programs established as a result of the research program.

Criteria for Inclusion: Children qualify for participation in the project on the basis of their hearing and their age. Children with pure-tone hearing losses of 50 dB or greater in the better ear across the speech range and not older than 4 years of age who live in geographically-targeted areas are eligible for participation. The hearing cutoff was established so as to include only those children whose hearing losses were significant. The age range established will allow for the older children to be enrolled for a full year of intervention services before their fifth birthday. Children under two years of age will not be enrolled since that is the age at which Alabama begins center-based services.

A pure tone audiometric evaluation is conducted by a licensed audiologist (certified by the American Speech and Hearing Association) and the results are used for identification and assignment purposes. Unaided scores, rather than aided scores are being used because a number of potential subjects have not yet been fitted with hearing aides.

Procedures for Identification and Assignment: Children who meet the age and hearing requirements are included as potential participants. After the regional directors have obtained parent informed consent agreements from the children's parents, the local site contact transmits the information to the EIRI coordinator along with the hard of hearing and age data (the two stratification variables). The children who are referred are then placed into 1 of 4 cells through stratification as follows:

	2-3 years	3-4 years
50 - 70 dB		
70 > dB		

If the child is the first child identified in a particular cell, a die with numbers 1 through 4 appearing on it is rolled. The number that appears on the die determines the assignment for the next four children in that cell as indicated below. This process is repeated for each "new" cell, or each new set of four children within a cell.

# Appearing on Die	Assignment Pattern
1 =	BABA
2 =	ABAB
3 =	BAAB
4 =	ABBA

Where A = Five 1/2 days per week
B = Two 1/2 days per week

All assignment to groups is made by the EIRI coordinator to ensure that no program staff have knowledge of where a particular child will be placed. Additionally, the dates in which children are identified are carefully tracked to ensure that children are assigned in the order in which they were identified.

Subject Attrition: Because this study has only recently started, and because few subjects have been assigned, attrition has not occurred. If and when attrition does occur, records will be kept of the dates of drop out, reasons for drop out and any other information which will be useful in analyzing a potential drop out subgroup.

INTERVENTIONS: Differing degrees of early intervention intensity with hearing impaired chidlren will be investigated by comparing children enrolled in the standard service currently available (2 days per week) with children in an expanded intervention program consisting of five days per week.

Standard services: In the regions selected for this study, center-based services are currently provided 2-1/2 days per week for children who live in the Talladega, Auburn, Dothern, and Tuscaloosa areasf. There is, then, a large pool of children who currently receive only the less intensive center-based service provided by AIDB. Thus, children in the standard services condition will attend the center-based program 2 days (6 hours) per week.

Weekly or bi-weekly home visits will also be made by AIDB staff to all children in both groups. During the home visits, the SKI*HI curriculum, a home-based model of service delivery developed at Utah State University and approved by the Joint Dissemination Review Panel for national dissemination, is utilized in providing services to the children and their families. The SKI*HI model utilizes parent advisors who visit each home to teach parents how to interact with their hearing-impaired children in ways that will facilitate the development of auditory skills, communication ability, and parent-child interaction. Skill building is organized around naturally occurring activities and materials. During subsequent visits, parents are asked to demonstrate what they have been doing, and necessary remediation is conducted before progressing to new materials.

Center-based services are based on a curriculum formulated by AIDB that emphasizes language, cognition and social development. The center-based program will focus on more structured activities designed to continue and supplement the auditory and communication skills training the children will receive via the home-based program, but also will focus on preacademic skills, social interaction, and independent working ability necessary for entrance into a public school program. The Learning Accomplishment Profile (LAP) will be used as the basis for daily activities after making necessary modifications for hearing-impaired children. The individual objectives in the LAP are hierarchically arranged under six specific domains: gross motor, fine motor, social, self-help, cognitive, and language. Based on a pilot program conducted during the last year, the modified LAP appears to be an excellent way of organizing activities for this group of children.

Expanded Services: Children in this group will attend the center-based program for five days (15 hours) each week. Weekly or bi-weekly home visits will also be made by AIDB staff. Other than the difference in the frequency of center attendance, all aspects of service will be the same as for the standard services group. Regional coordinators will keep a "visit by visit" log of interventionist's home visits. This will ensure that home visits are occurring consistently in both the standard services group and the expanded services group.

Optional Services: Several optional services are provided equally to the two groups. These include medical and local service agencies which are available to parents. The extent of their participation will be monitored by completion of the Additional Services form at posttest time.

TREATMENT VERIFICATION: A number of procedures are being used for purposes of verifying that the treatments are being implemented as intended. First, initial agreements are being made between the EIRI coordinator, the AIDB coordinator, the regional coordinators and the individual interventionists pertaining to the actual types of services which will be provided, the intensity and duration of these services, record keeping of each child's activities pertaining to these services, attendance records and any other records which may facilitate a detailed description of each of the treatments as they are provided to the children and their families.

Second, the research coordinator in Alabama will closely monitor the activities of the inter-ventionists, keeping a record of their home visit activities, periodically accompanying interventionists on home visits in order to provide feedback on their approach, and implementing other monitoring activities on a regular basis. Third, the research coordinator will correspond with the regional interventionists at least once a week, to discuss new subject enrollment, testing, any service delivery difficulties and to transmit communications from EIRI pertaining to attendance data, attrition and/or new enrollments. Fourth, the EIRI coordinator will be in weekly communication via telephone with the AIDB coordinator to discuss any concerns raised by any of the interventionists as well as any of the issues detailed above. Fifth, both AIDB and EIRI coordinators will make periodic site visits (the AIDB coordinator will visit more frequently than the EIRI coordinator, but will report the events of each visit to the EIRI coordinator). These site visits will include meetings with interventionists. Sixth, as was mentioned, daily attendance records will be kept and submitted to the EIRI coordinator on a monthly basis. These records will include information about daily attendance, the length of each session and a listing of all staff involved in each session. Seventh, parents will be reporting by means of weekly postcards how much time they spend with the program staff and how much time they spend working with their child on suggested activities. Eighth, a formal site review will be conducted annually. This will be discussed further in the following section.

SITE REVIEW: A formal site review will be conducted annually by the EIRI coordinator to ensure that treatments are being implemented as intended and that all predetermined procedures are being followed as specified. The site review will consist of the following: a cumulative review of at least six subjects' folders, direct home visit observations, interviews with interventionists and interviews with at least three parents.

DATA COLLECTION: Several measures have been selected to examine the effects of the two intensities of intervention with the hearing impaired subjects. The focus of the data collection is on assessing language development, family adaptation and cognitive/social development.

Pretest. Parents of each child participating in the study will complete an informed consent form and provide demographic information. Although the Battelle Developmental Inventory (BDI) was not specifically designed for use with the hearing impaired population, an adaptation of the BDI which has been developed for administration to hearing impaired children will be used in this study because several of the BDI domains are especially relevant to this study (cognitive, communication, and personal/social). Additionally, parents will complete the Parenting Stress Index, Family Support Scale, Family Resource Scale, the Family Inventory of Life Events and Changes, and the Family Adaptability and Cohesion Evaluation Scales. These measures will primarily be used to establish pretesting levels of family functioning which will be used as covariates in the analysis as well as to investigate whether certain types of families or certain types of children profit more from intervention than others.

The BDI will be administered by a trained diagnostician who is unaware of the child's group assignment. Testing will occur at the center, ensuring that the testing environment is equally unfamiliar to all subjects. The parent, usually the mother, will complete the family measures following completion of the BDI. The Family Support Scale will be given to the mothers to take home if they have a spouse or spouse equivalent who can complete it. The diagnosticians will complete the testing report and then copy and send all data to the EIRI coordinator who will copy and send all data to EIRI via certified mail.

Posttest. The core posttest measures will be collected in the spring of each year and will consist of the BDI and the other parent measures discussed above.

Additionally, a parent satisfaction with the treatment questionnaire and parent report of child's health will be administered to the parents. Complementary measures have been chosen to reflect gains made in language ability as well as social gains which are expected to be the result of the expanded services treatment which will be heavily emphasizing language and grammatical development and which provides children with the opportunity to interact with their peers on a daily basis. Measures which have been selected include the Peabody Picture Vocabulary Test, the Meadow Kendal Social Emotional Developmental Inventory for Deaf Students, and the Grammatical Analysis of Elicited Language.

DATA ANALYSIS: Data analysis will be conducted on pretest measures comparing the two treatment groups. Additionally, pretest analyses will include comparisons across each strata. Posttest data analyses will be conducted using the pretest data as covariates in order to control for any preexisting differences between treatment groups.

FUTURE PLANS: A total of fifty subjects ranging from 2 to 4 years of age with moderate hearing losses will be enrolled during the first half of the year. A formal site review will be conducted in mid-November. Posttesting will be conducted during the spring after which no additional subjects will be enrolled. As subjects reach the age for transition to public school services, additional measures will be used to evaluate their transition and adjustment abilities. It is expected that of the children transitioning from the early intervention service, 30% will continue to receive their schooling through AIDB while the remainder will be placed in traditional public school programs for hearing impaired children. The costs of treatment implementation and later school placement will continue to be collected and analyzed.

SUNSHINE PRESCHOOL--RICHARDSON CENTER
Project #4 (Treatment Intensity)

COMPARISON: Mildly to Severely Handicapped Children -- Home-based intervention 2 times per month versus home-based intervention 8 times per month.

LOCAL CONTACT PERSON: Lowell Collins, Coordinator (Sunshine Preschool); Janice Hardin, Coordinator (Richardson Center).

EIRI COORDINATOR: Kathryn Haring

LOCATION: Benton County, Arkansas, and Fayetteville, Arkansas.

DATE OF REPORT: 9-4-87

RATIONALE FOR THE STUDY: Limited evidence in the existing literature is available to guide programming decisions concerning the relative effectiveness of various intensities of early intervention (White & Casto, 1985). The frequency and intensity of early intervention services varies across program models and professional judgement of individual child needs. This study was designed to respond to the practical need identified by programs requesting data based guidelines for use in determining what is the most appropriate level of intensity to provide. The experimental design of this study provides a clean comparison of the effectiveness of two different levels of intensity of home-based service for children from birth to five years old.

The intensity issue is of particular importance in programs serving moderately and severely handicapped young children. The research in this area is sparse (Bailey and Bricker, 1984). Parents and professionals alike have made decisions regarding the form services should take based on their past experiences and philosophies of the human condition (Fredericks, 1985). Rarely are the developed models, approaches, or curricular contents evaluated in a systematic manner (Switsky & Haywood, 1985). The field lacks empirical findings in many issues critical to the training and education of severely handicapped young children. This research enriches the existing data base and will yield information necessary to better determine the optimal frequency of home visits.

The effects of varying the intensity of service are being investigated within the framework of Family Systems Theory (Haley, 1976, 1980). therefore, we will assess the impact of the two intensity levels on both child and family outcomes. The family systems theory, an extension of the interaction process approach, provides a conceptual framework through which to study the impact of early intervention on the families of handicapped children. When the delivery system is primarily home-based, significant amounts of parent time are required. Some data indicate that interventions requiring substantial parent time may actually increase stress and disrupt family functioning (Turnbull, Summers, & Brotherson, 1983). Clearly, further research in this area is warranted.

This research is exploring the relative effectiveness of two levels of intensity. Particular attention is being paid to the differential effects of intervention relating outcome to severity of handicap. The impact of the level of intensity on the family is also being explored.

PROGRAM ORGANIZATION: The Sunshine Preschool and Richardson Center are funded under the Arkansas Developmental Disabilities Council to service handicapped individuals not served by the public schools. The two programs are administrated by onsite coordinators who manage the research. The programs serve birth to adult handicapped persons; each has a home- and center-based program for preschool handicapped.

Prior to the initiation of the research, the Richardson Center was entirely center-based. They were not satisfied that the center-based delivery system was the most effective system available for serving young handicapped children. They looked to the Sunshine Center as a model for home-based delivery. When the Richardson Center decided to adopt a home-based model, they were invited to participate in the research. The EIRI site coordinator randomly assigned the Richardson children-based on the Sunshine stratification. The staff at Richardson were then trained and evaluated by the Sunshine coordinator. Richardson has a staff of approximately 30 professional and paraprofessionals. There are 2 home-teachers, a speech and a physical therapist involved in serving the children in the study. Richardson also has 6 classrooms and a vocational workshop serving handicapped persons.

The Sunshine school has 2 separate facilities that house classrooms, offices and a vocational program. Sunshine has a larger staff and serves more clients. Both Sunshine and Richardson Centers have a well developed philosophy. Their main service goal for preschoolers is to provide them with functional generalizable skills to enhance development. Both centers transition some children into public school special education programs, and continue to provide school age services to the most severely disabled. This process is explained in the program verification section.

Prior to our research, the Sunshine Center operated its home program much as it does now. The average frequency of home visits was once every week or every two weeks depending on the severity of the child's handicap.

SUBJECTS: A total of sixty-two 3 to 48-month-old children with mild to severe developmental delays were randomly assigned to the two treatment conditions after stratification by chronological age and developmental functioning level as assessed by the Battelle Development Inventory. Currently, there is pretest data scored and coded on 48 subjects at the Sunshine Center and 14 subjects at Richardson Center. Descriptive data for currently enrolled subjects are presented in Tables III.4 and III.5. Over 30% of the children served are challenged with severe and multiple handicaps. The population in the area to be served is primarily rural. The ethnic background of the subjects if predominately Caucasian (85%). Family incomes range from less than $5,000 to $39,999, with 30 % falling into the low SES category. The average number of years of education for parents is between 11 and 12 years for both groups.

Criteria for Inclusion: Children in the programs participating in the Sunshine/ Richardson Center project qualify for participation in the research on the basis of

Pretest Demographic Data for High and Low Intensity Groups - Sunshine/Richardson

Variable	Low Intensity Group			High Intensity Group			P value
	N	Adjusted Mean	SD	N	Adjusted Mean	SD	
Chronlogical age in months	33	26.30	14.93	32	26.44	12.28	.97
Percent of Male Cases	33	58.8%		33	54.5%		.62
Percent of Mothers Living with Child	32	91.2%		30	90.9%		.34
Educational Level of Mother (yrs)	32	11.8	2.30	30	12.1	2.20	.54
Educational Level of Fathers (yrs)	30	11.3	1.50	30	12.0	2.60	.18
Percent of Unemployed Fathers	29	14.7%		27	15.2%		.80
Percent of Households Receiving Public Assistance	32	50%		30	45.5%		.81
Percent of Households Speaking English		94.1%			90.9%		
Percent of Multihandicapped Children		29.4%			15.2%		
Percent of Caucasion Children		88.2%			84.8%		
Percent of Married Mothers		79.4%			75.8%		
Percent of Children with Handicapped Siblings	32	53%	1.49	30	46%	2.10	.79
Percent of Households Under $22,000	32	71.1%	2.10	27	50%	2.50	.15

T-Test Analysis of Sunshine and Richardson Pre-test Data

Variable	Low Intensity Group			High Intensity Group			t value	P value
	N	Mean	SD	N	Mean	SD		
BDI								
Total Raw Score								
Personal-Social	33	11.7	8.1	32	14.5	8.1	-1.36	.179
Adaptive Behavior	33	13.3	11.1	32	15.9	9.5	-1.00	.319
Gross Motor	33	13.7	15.8	32	12.4	9.2	.40	.690
Fine Motor	33	14.7	14.4	32	14.2	9.6	.17	.867
Motor Total	33	13.9	14.4	32	12.7	8.7	.41	.681
Receptive Communication	33	12.4	11.6	32	14.1	9.6	-.65	.516
Expressive Communication	33	11.2	8.9	32	13.0	7.7	-.86	.393
Communication Total	33	11.2	9.9	32	13.0	8.5	-.80	.425
Cognitive Total	33	12.9	11.8	32	14.7	8.8	-.66	.510
BDI Total	33	12.6	10.3	31	14.4	8.1	-.74	.462
Parent Stress Index Total (mother)	33	127.1	30.8	30	125.7	27.1	.20	.044
Parent Stress Index Total (children)	33	125.4	26.6	30	113.5	22.7	1.90	.062
Family Support Scale Total (mother)	33	28.9	10.9	30	31.6	12.8	.90	.370
Family Resources Scale Total (mother)	33	115.7	24.9	29	114.7	18.9	.17	.067
FACES Raw Score - Perceived (mother)	33	62.5	10.6	29	61.6	7.7	.39	.697
FACES Raw Score - Ideal (mother)	33	73.6	10.5	29	71.6	9.8	.79	.431
FILE Total Score	33	8.4	5.2	20	11.4	7.2	1.90	.063

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and Adaptability scores indicate greater amounts of these factors.

their age, and type and severity of handicapping condition. For each child who meets the study criteria, parents must indicate that they are willing to participate in either the high intensity or the low intensity conditions depending upon where the random assignment places them. Children cannot be enrolled in the study if over 48 months of age. This ensures that participants receive a minimum one year of treatment before graduation to public school programs. The children are initially screened using the Alpern-Bole, if they are functioning significantly below age level further individualized assessments are administered. A child who can complete 75% of items at their age range are excluded from further evaluation. Individual assessments include general developmental measures, and speech, occupational, and physical therapy evaluation.

Procedures for Identification and Assignment: Children in each program who meet the minimum age and severity criteria are included as subjects in the study. The home teacher assumes the role of case manager and is responsible for explaining the research and obtaining informed consent. All of the parents whose children were in the home program at Sunshine or Richardson were approached about possible participation in the study, 95% of the approached parents agreed to participate.

The random assignment was carried out as described below. The following variables were stratified in the random assignment: Chronological age and severity of handicaps were broken into three cells each as follows:

Chronological Age by Months

	0-20	21-35	36-60
1 Mild			
2 Moderate			
3 Severe			

If the child is the first child identified in a particular cell, a die with the numbers 1 through 4 appearing on it is rolled. The number on the die determines the assignment for the next four children in that cell as follows:

# Appearing on Die	Assignment Pattern
1	ABAB
2	BABA
3	ABBA
4	BAAB

Where A = High Intensity Intervention
B = Low Intensity Intervention

This process is repeated for each cell, and each new set of four children within a cell.

All assignment to groups is made by the EIRI coordinator to ensure that no program staff has knowledge of where a particular incoming child will be placed.

The random assignment is carried out by the EIRI coordinator to protect against possible bias.

Subject Attrition: Two subjects have moved and have proved untraceable. One parent removed her child from the study because of displeasure with the random assignment. Two severely handicapped subjects have died as a result of medical complications. One subject was lost to the study because the program staff felt the classroom setting would better serve that child's needs. Attrition appears to be random, an analysis of pretest data on those who have dropped out versus those who have remained is planned.

EXPERIMENTAL INTERVENTIONS: The high intensity intervention is an expansion of the basic service that was delivered prior to the initiation of the research. It consists of eight home sessions per month and is compared to a lower intensity of two times per month. The therapy ratio is 4:1, high intensity receiving four therapy sessions a month versus low intensity receiving one.

High Intensity Group: The high intensity group have received an average of 8 intervention visits per month from train paraprofessionals. The program coordinator is responsible for training. The home teachers spend 2 weeks in individualized training, and are then closely supervised on their first home visits. There are 7 home teachers, of them 2 have degrees and all have extensive experience and background.

Motor and speech/language therapists provided individual therapy on a weekly basis.

The children are brought to the center for their therapies that last approximately 1/2 hour. The home-based intervention takes place primarily in the subject's home, although a small number of children are visited in daycare centers or at baby sitters. The home teachers focus on working with the children directly. The parents are expected to observe and model. Home visits last from 1 to 2 hours.

Curriculum is based on comprehensive assessments and is basically a modification of the Learning Accomplishment Profile.

The home teacher brings a variety of materials and toys for programs and the child's folder for recording data. The home teacher works individually with the child, keeping data on 4 to 6 goal areas. Every attempt is made to involve the parents in the activities. For example, the home teacher will demonstrate how to position a child for feeding and provides direct modeling, shaping, prompting and positive reinforcement to the parent.

Once the teacher has instructed the parent on how to carry out the activity, the teacher sets up a schedule for the parent to follow through with the intervention program on the days when home visits do not take place. The amount of time a parent is expected to spend with the child depends on the child's needs and the parent's willingness and ability. The time parents spend daily ranges from 20 minutes to 2 hours.

The intervention programs, provided by the home teachers and therapists, are individualized and based on the child's developmental level and the family's functioning. The severely handicapped children are provided with functional programs. Usually the goals will include self help (particularly feeding), gross motor, and communication skills. The primary care taker is required to demonstrate skill in positioning, feeding, and in 15 cases, medical technology such as oxygen, respirators, gavage feeding, and catheters. The home teachers are highly specialized in these areas and help parents meet the medical as well as developmental needs of their children. The more mildly handicapped children receive equally individualized programs to meet their language, cognitive, self-help, and gross and fine motor needs.

Home teachers tend to be assigned to children based on the children's level of functioning. Two of the 5 teachers have extensive experience with the severely handicapped. The other 2 teachers have strong early childhood backgrounds. Each teacher was observed at least 4 times annually by the EIRI staff coordinator and has consistently demonstrated knowledge, creativity and sensitivity in dealing with birth to 5 year old children who are handicapped.

The home visit typically consists of the following activities: warm-up play period, discussion of current concerns and child's status, direct 1:1 programming designed to meet specific objectives, work with the parents, discussion of progress made towards objectives and data recording. When ending the visit the teacher reminds the parent of the next visit and of any scheduled therapies; leaves data sheets, program descriptions, detailed instructions, and materials for the parent to use; and gives the parent encouragement and praise. Program data and anecdotal notes are recorded for each home visit.

The teachers create data recording sheets for parents that include the following: 1) a specification of the activities to be conducted; 2) spaces to record data and duration of activity; 3) spaces to record correct and error or progress made towards the objective. In some cases the only data recorded by parents is whether or not the activity took place, or how the activity went. For example, in a feeding program, the key data to record would be that the child consumed 2 ounces orally.

The teachers keep more detailed data on number of trials, correct and error rates, and a specified description of what progress took place towards each objective worked on. The teachers anecdotal records tend to describe the session, the parent's and child response, and plans for the next session.

The content of the home visits are based on (1) recommendations made by the multidisciplinary assessment team, which typically includes a psychologist, speech/language pathologist, OT/PT, educator, and the child's parent, and (2) jointly by the educator and the parent based on the child's progress over time. An Individual Habilitation Plan (IHP) is developed for each child based on this information and is used to guide the educator in working with the parent during the sessions. A variety of assessment instruments and curricula are utilized to develop the specific objectives in the IHP.

The IHPs are evaluated by the multidisciplinary team on a quarterly basis. All goals which have been achieved are recorded on a quarterly summary and shared with the multidisciplinary team. (During the site visit described below, 10% of the IHPs were randomly sampled and recently evaluated and found to be age appropriate, developmental, and functional in nature.)

Sunshine and Richardson Center also use a multidisciplinary team approach to assessment. The initial screening is conducted in the child's home utilizing the Alpern-Bole. If significant delays are found, a consultation is held in which further assessments are recommended. The child is typically assessed individually by each member of the team.

Low Intensity Group: The low intensity group received exactly the same type of service delivery as the high intensity group, but only on an average of 2 times per month for home visits, once monthly for center-based therapy. This lower frequency of home visits approximates the level of service which existed through the Sunshine Preschool prior to the initiation of research.

Optional Services: The two centers offer parent training and support sessions to parents on an intermittent basis. These are optional services and typically do not draw a majority of the parents. There have also been play groups organized for purposes of socialization. Due in part to the rural nature of the program and transportation problems, parent groups and play sessions have not been well attended.

TREATMENT VERIFICATION: A number of procedures have been implemented in order to verify that the interventions for the two different experimental groups are being implemented as intended.

The EIRI coordinator communicates on at least a weekly basis with the onsite coordinator, assists in areas of program developmental and child find efforts, places all children into service options and makes periodic site visits. The site has been visited 3 times this year by the EIRI site coordinator. Other program verification activities included:

1. Collection of attendance data. The child's participation in the program for both groups is recorded according to the length of the session and the staff involved. Non-attendance at regularly scheduled sessions is also recorded according to the reason for non-attendance. The average percentage of attendance at home visits was 84% for the low intensity group and 77% for the high intensity group. The average percentage of attendance of therapy sessions was 88% for the low intensity group and 83% for the high intensity.

2. Parent report of time: Parents complete postcards on a weekly basis which indicate a) how much time they spent with a staff member of the program, and b) how much time was spent working with the child on activities suggested by the program. Data indicates that 62% of parents have returned the cards.

   These data are intended to document how much time parents spend implementing the program. This was initiated to assure that true group differences in intervention are taking place. This information is important, for example, if a low intensity parent spends as much time as a high intensity parent in carrying out program related activities, then you have far less of a group difference. Parents in the low intensity group received a mean of 2.05 in attendance, 1.72 in knowledge of their child and rights, and 1.68 in support activities. Parents in the high intensity group received a mean of 2.29 for attendance, 2.13 for knowledge, and 2.04 for support.

3. Data describing the quality of parent involvement has been collected: Staff members rate parents in 3 areas: attendance (in IHPs, meetings, therapy, home visits), knowledge regarding their child and rights, and support activities (follow through, communication with staff, form completion, etc.) Parents are scored in each area with a 3-point scale, 1 = low, 2 = average, 3 = high. Results indicate that no significant group differences exist on the variable of parent involvement.

4. Teacher evaluations have been completed: The onsite coordinators evaluated teachers on a 30 point scale that assessed: general competency and skill, problem solving, work habits, relationships, communication and attitude, the following scores were reported: 30, 30, 30, 30, 30, 23, and 18. Only one teacher had an area that needed improvement and that area has been improved. All the teachers were rated as having fully met the criteria developed in the following areas: assessment, IEP development & implementation, presentation of instruction, and instructional environment.

SITE REVIEW: A formal site review was conducted on May 20-22, 1987, as a part of a continuous effort to verify that treatment is taking place as planned. The EIRI Site Coordinator met with both Richardson and Sunshine Coordinators as well as with parents, ancillary staff and all home teachers. In addition, the EIRI Site Coordinator attended 7 home visits in order to observe each teacher at work.

Results of the site review indicated that the project is well organized and implemented. The program files were in good order, containing up-to-date IHPs, quarterly reports of progress, assessment information and description of services received. Six IHPs were randomly selected for detailed review and all of them contained the following: 1) a statement of current level of performance, 2) annual goals and short term objectives that were functional, appropriate, and individualized, 3) evaluation criteria for determining when objectives were met, and 4) timelines for monitoring. The quarterly reports were particularly impressive. They indicated information of a detailed nature documenting progress data in a minimum of 6 goal areas.

The same folders were reviewed for assessment information and evidence of a multidisciplinary approach was indicated through speech/language, OT & PT evaluations.

In addition, criterion-referenced measures such as the Hawaii, and the ELAP were in evidence in all the folders.

The site visit observations were in general a pleasure. The teachers all demonstrated well-organized lesson plans, procedures for data collection, appropriate use of materials and activities, good rapport with the families and excellent skills with young handicapped children. The home teachers are primarily paraprofessionals; however, their teaching demonstrates excellent experience and training. The EIRI site coordinator has reviewed the training procedures with the on-site coordinators and they are adequate and consistently implemented.

The Sunshine site has state-of-the-art procedures for transitioning children into other programs. They spend a year discussing the transition with parents, take parents to visit new programs, conduct meetings with parents and current and future staff, and often send a home teacher with the child for the first few days. A system of follow-up is in place and the staff of Sunshine maintain contact with parents and the staff who have received the child.

Based on the site review, it was determined that treatment has been implemented as planned. The site has requested technical assistance in the areas of functional programming for the severely handicapped and activities to meet family needs. The EIRI site coordinator did a workshop with them in January 1987 on assessment and functional skill development for severely handicapped. Although no apparent weakness has been observed in the staff's ability to meet parent needs, it is of interest to them and will be pursued.

DATA COLLECTION: Pretest. Parents of each child participating in the study completed an informed consent form and provided demographic information. Children were administered the Battelle Developmental Inventory, and parents completed the Parenting Stress Index, Family Support Scale, Family Resource Scale, Family Inventory of Life Events and Changes, and the Family Adaptability and Cohesion Evaluation Scales as pretest measures. Parents are paid a $20 incentive for participation in testing. Information from these measures will be used as covariates in the analysis as well as for investigating whether certain types of families or certain types of children profit more from intervention than others.

Posttest. Posttest measures were collected in the spring of this year and consisted of the Battelle Developmental Inventory and the various parent questionnaires mentioned above. In addition, a parent satisfaction with treatment questionnaire and parent report of child's health are administered at posttest. Project-specific posttest instruments will include the Sequenced Inventory of Communication Development. The Sequenced Inventory of Communication Development was chosen as a complementary measure because of the intervention emphasis on language development. Videotaped segments will also be obtained on a pretest-posttest basis to capture child progress on cognitive, language, self-help, and motor goals. The PPVT will also be given to the primary care taker.

Only children who have received services since September 1986 have been posttested in the Sunshine Center. The Richardson Center will be posttested in August 1987. These children will have received service since January 1987. A total of 36 subjects have been posttested, it is anticipated that 45 subjects who will have received from 7 to 9 months of service will be posttested by August 1987.

Assessment Management: There are 3 diagnosticians who have been trained and certified by EIRI, all are completely "blind" to group placement of subjects. They each possess a masters degree at the minimum and are under the direction of a Ph.D. level assessment supervisor. The assessment supervisor has been responsible for: shadow scoring 10% of each diagnosticians test administrations, providing a videotape of each tester, scheduling testing, and collecting, reviewing, and sending all protocols to the EIRI site coordinator.

A review of the video-tapes as well as a calculation of the interrater reliability coefficient of .95 between shadow scored tests indicates that the testers are performing well.

DATA ANALYSIS: Results of pretest data analyses are presented in Tables III.4 and III.5. Table III.4 presents descriptive data on the children, and Table III.5 presents their Battelle pretest scores. There were no statistically significant differences in the Battelle scores in any domain or subdomain, and none on the pretest parent measures. Battelle pretest data (in each domain) were the best predictors of Battelle posttest scores, with correlations ranging between .72 and .96. All were statistically significant at the $p < .001$ level. The pretest Battelle total raw score was then used as a covariate in a MANCOVA, with treatment groups (high intensity vs. low intensity intervention) as the independent variable and Battelle posttest raw scores as the dependent variables.

Pretest demographic data and treatment verification data will be analyzed to improve the generalizability of our data by allowing us to control for family demographic differences and differences in the intensity of the intervention .

The pre- and posttest preliminary analyses of Sunshine BDI scores and family measures is presented in Table III.6. Table III.6 indicates that there was an interaction between group membership and the covariate, in that adjusted scores were higher for the low intensity group and lower for the high intensity group.

Table III.6 also indicates that there were no statistically significant differences between groups in scores on the family measures. Although these data could be interpreted to mean that the use of high vs. low intensity intervention makes little differences in the developmental progress of preschool-aged children who are handicapped, such an interpretation would be premature for several reasons. First, sample sizes for this analysis are still relatively small (only 36 subjects had full pre- posttest scores available), and the length of intervention is quite short (only

Table III.6

Ancova Analysis of Sunshine Pre and Posttest Data

Variable	Low Intensity Group			High Intensity Group			P value	ES
	N	Adjusted Mean	SD	N	Adjusted Mean	SD		
BDI								
Total Raw Score	17	234.63	143.67	18	223.04	93.84	.275	-.098
Personal-Social	17	62.23	35.09	18	60.55	27.37	.654	-.054
Adaptive Behavior	17	47.99	29.63	18	43.54	19.57	.126	-.181
Gross Motor	17	40.88	24.02	18	36.45	18.36	.201	-.209
Fine Motor	17	27.61	19.05	18	25.06	13.56	.283	-.156
Motor Total	17	68.49	42.42	18	61.52	30.15	.155	-.192
Receptive Communication	17	14.35	10.21	18	13.35	4.70	.518	-.134
Expressive Communication	17	15.75	12.30	18	17.85	7.86	.168	.208
Communication Total	17	30.10	22.15	18	31.20	12.06	.691	.064
Cognitive Total	17	28.09	18.88	18	23.95	10.54	.123	-.272
Parent Stress Index Total (mother)	17	133.22	27.85	17	125.14	27.06	.137	-.294
Parent Stress Index Total (children)	17	118.52	26.82	17	118.13	18.30	.946	-.017
Family Support Scale Total (mother)	17	30.28	16.30	14	30.96	14.87	.872	.044
Family Resources Scale Total (mother)	17	112.85	24.24	15	118.48	23.27	.186	.237
FACES Raw Score - Perceived (mother)	16	58.61	9.63	16	61.77	4.95	.201	.433
FACES Raw Score - Ideal (mother)	16	69.82	8.11	18	70.81	5.25	.659	.148
FILE Total Score	17	8.33	6.14	16	8.49	5.48	.903	.028

$$ES = \frac{\text{Adjusted Mean High Intensity - Low Intensity}}{\text{NP/P SD Mean}}$$

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and Adaptability scores indicate greater amounts of these factors.

nine months at this point). Also, over 30% of the sample are severely multiply handicapped, and the BDI (which is the only developmental measure analyzed thus far) may not be a test that is sensitive enough to measure the small incremental steps in progress that severely handicapped children make. Fortunately, there are two complementary child progress measures (pre- and posttest videotapes of the severely handicapped children and the SICD, a measure of expressive and receptive communication skills) that have been collected and have yet to be analyzed.

A second explanation of these preliminary results could concern the level of intensity in the study. Perhaps, for severely handicapped children, twice a week home visits are not an intense enough intervention to produce significant progress. Further analyses, including results from the complementary measures and treatment verification data are planned. When all data (on the 68 subjects) are available, and the intervention has taken place for a year at minimum, different results may be found.

FUTURE PLANS: The Sunshine/Richardson site has currently collected data on 62 children. It is anticipated that posttest data will be ongoing as enrollment has been continuous. Posttesting in 1987-88 will be conducted in three waves in October 1987, January 1988, and June 1988. As the children reach their twelve-month enrollment they are posttested.

Treatment will continue through the 1987-88 school year, however the degree of intensity will change. The high intensity group will continue to receive twice weekly services and the low intensity group will receive service once a week. Six children will be graduating to special education kindergarten and two subjects are moving out of the service area. These children will continue to be tracked longitudinally. The site will continue to provide cost data so that economic analysis can be conducted. All current procedures for treatment verification, site visitation, and EIRI coordination will continue through Spring, 1988.

INTERAGENCY PROJECT FOR EARLY INTERVENTION
(SMA/Lake-McHenry)
Project #5 (Treatment Intensity)

COMPARISON: Moderately to Severely Handicapped Children--Once-per-week versus three-times-per-week services.

LOCAL CONTACT PERSON: Alice Kusmierek, Coordinator, Interagency Project for Early Intervention.

EIRI COORDINATOR: Stacey McLinden-Mott

LOCATION: Lake, McHenry, & Cook Counties (Chicago Suburbs)

DATE OF REPORT: 9-4-87

RATIONALE FOR STUDY: Although popular support for early intervention efforts has been strong, the research base on early intervention effectiveness has shed little light on important issues such as the relative effectiveness of various program intensities (White & Casto, 1985). The research base which has dealt with moderately to severely handicapped young children is particularly sparse (Bailey & Bricker, 1984). Indeed, it is only within the last 12 years, since the advent of P. L. 94-142, that children with significant impairments have been systematically included in early intervention programs (Bailey & Bricker, 1984). Very little is thus known about the optimal intensity of services to be provided to moderately to severely impaired young children. The progress of moderately to severely handicapped children is typically quite slow even in the most intensive intervention programs. Yet, little is known about whether more frequent services are more effective.

The basic level of service examined in the present study, once per week, is a typical service delivery model for handicapped children under age 3 (Bricker, 1986). However, given the severity of the handicaps which the children in this population represent, as well as the possible impact of the child on his/her family, once-per-week services may not be sufficient for maximizing both child and family functioning. The expanded level of service in this study, three sessions per week, has the potential to provide more intensive intervention to these children, without being so intensive as to interfere with the development of the mother-child relationship which is so important in the birth to 3-year period. The experimental design of this project will allow for a clear comparison of the effectiveness of two different intensities of early intervention programs for moderately to severely handicapped children between birth and age three.

This study will also respond to the practical need in the State of Illinois for an evaluation of the feasibility of expanding current levels of early intervention services. A part of the funding for these projects is provided by the State to institute more comprehensive services and to evaluate the relative effectiveness of these services. An examination of the costs involved in the relative intensities of these programs will also be an important outcome of this study.

PROGRAM ORGANIZATION: The Interagency Project for Early Intervention (IPEI) is a consortium of six agencies providing early intervention services to children between birth and age 3. This consortium, which is a collaborative effort on the part of six administratively and fiscally independent agencies, is funded by the state of Illinois to examine the costs and effects of expanding intervention services to the birth to 3 population. The area served by the consortium includes suburbs to the north and south of Chicago which are representative of urban, suburban, and semi-rural areas throughout the state of Illinois. The total number of at-risk and handicapped infants and toddlers served in the consortium area during fiscal year 1985 was approximately 900.

Three of the agencies involved in IPEI have provided subjects for this study: South Metropolitan Association (SMA), Lake-McHenry Regional Program, and Southwest Cooperative Association. These agencies were selected to participate in this EIEI study because they all: (a) provide once-per-week individual parent-infant sessions as the basic level of service; (b) employ professional, as opposed to paraprofessional staff; and (c) served the largest numbers of children of the six agencies in the consortium.

This study compares the costs and effects of two different frequencies of early intervention service. The basic level of service is the service which has been provided historically to all children served by the IPEI programs. The expanded level of service is funded by a pilot program grant from the state of Illinois.

SUBJECTS: There are currently 70 subjects who were between 1 and 24 months of age (mean = 11.80 SD = 6.60) at the time of study enrollment. Fifty-one subjects are moderately to severely handicapped, 6 are hearing impaired, 1 is visually impaired, and 12 have speech/language or motor delays. Subject recruitment occurred between January 1986 and June 1987. Thirty subjects participate in the Lake-McHenry program, 26 in SMA, and 14 in Southwest Cooperative. Pretest data for currently enrolled subjects are presented in Tables III.7 and III.8. As indicated in the table, the groups were comparable on all pretest variables.

Criteria for Inclusion: Children in the programs participating in the SMA/Lake McHenry project qualified for participation in the research on the basis of their age and type and severity of handicapping condition. All children were 24 months old or younger at the time they were enrolled in the project. This cut-off point was selected to ensure that children were able to participate in the study for at least 12 months and were still enrolled in their respective programs before reaching age 3, at which time they become eligible for services provided by the local school district.

Severity was based on rates of development derived from a ratio of the child's behavior age divided by his or her chronological age (with a gestational adjustment through age 2). The behavior age was defined in reference to an age equivalent score derived from the Wisconsin Behavior Rating Scale. A moderate delay was defined as a behavior age divided by an adjusted chronological age which was greater than or equal

Table III.7
Comparisons of Experimental Groups on Various Pretest Variables for SMA/Lake-McHenry

Variable	Once Per Week (Basic Intervention)			Three Times Per Week (Expanded Intervention)			t-test
	mean	(SD)	n*	mean	(SD)	n	p
Age in months at Wisconsin Pretest	12.35	(6.73)	37	11.18	(6.50)	33	.46
Wisconsin Score	.56	(.28)	37	.57	(.27)	33	.89
Parenting Stress Index Total Score (Mother)	247.32	(39.47)	37	231.33	(43.39)	33	.13
Family Support Scale Total Score (Mother)	29.28	(11.02)	25	28.30	(9.00)	23	.74
Family Resource Scale Total Score (Mother)	124.32	(19.28)	25	120.43	(14.50)	23	.44
FACES III Discrepancy Total Score (Mother)	10.16	(10.81)	25	8.61	(9.94)	23	.61
FACES III-Cohesion	37.84	(8.46)	25	39.87	(5.55)	23	.34
FACES III-Adaptability	22.44	(4.65)	25	24.30	(6.72)	23	.27
FILE Total Score Past 12 Months (Mother)	11.68	(7.90)	25	13.00	(6.10)	23	.52

*Information on subjects is obtained at initial referral and then again after pretest. Some data, therefore, are not yet available on all subjects.

NOTE: On the PSI and File, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and adaptability scores indicate greater amounts of these factors.

Table III.8

Comparisons of Experimental Groups on Battelle Developmental Inventory Pretest Raw Scores for SMA/Lake-McHenry

Variable	Once Per Week (Control Group)			Three Times Per Week (Experimental Group)			t-test
	mean	(SD)	n*	mean	(SD)	n	p
Personal Social	29.89	(16.52)	27	29.26	(15.41)	27	.89
Adaptive Behavior	23.89	(13.13)	27	23.11	(11.95)	27	.82
Gross Motor	20.56	(15.95)	27	19.44	(14.06)	27	.79
Fine Motor	12.11	(8.47)	27	10.85	(7.78)	27	.57
Motor Total	32.67	(24.26)	27	30.30	(21.46)	27	.71
Receptive Communication	8.67	(4.01)	27	8.22	(3.67)	27	.67
Expressive Communication	7.26	(4.16)	27	7.22	(4.35)	27	.98
Communication Total	15.93	(7.83)	27	15.44	(7.67)	27	.82
Cognitive	14.22	(8.91)	27	14.04	(7.50)	27	.93
Battelle Total Score	116.59	(68.69)	27	112.15	(61.03)	27	.80

*Information on subjects is obtained at initial referral and then again after pretest. Some data, therefore, are not yet available on all subjects.

to .35 or less than or equal to .65. A severe developmental delay was defined as behavior age divided by the adjusted chronological age which was less than .35. Children with hearing impairments and visual impairments were also included as subjects in the study. Hearing impairment and visual impairment were further broken down into categories of no other impairment and impairment with moderate and severe delay. This resulted in eight categories of handicapping conditions as follows: (1) moderate developmental delay, (2) severe developmental delay, (3) hearing impaired with normal intelligence, (4) hearing impaired with moderate developmental delay, (5) hearing impaired with severe developmental delay, (6) visually impaired with normal intelligence, (7) visually impaired with moderate developmental delay, (8) visually impaired with severe developmental delay.

In order to increase the number of children in the study, in December, 1986, a decision was made to enroll children whose performance during the multidisciplinary team assessment indicated delays (i.e., equivalent to 1 standard deviation or more below the mean on standardized instruments utilized by speech/language and motor therapists) in either speech/language or motor functioning. These children formed a separate group for purposes of random assignment.

Subject Identification and Random Assignment: Children in each program who met the requirements outlined above were included as subjects in the study. Subjects were identified and randomly assigned to groups on an ongoing basis. For each child who met the study criteria, parents indicated that they are willing to participate in either the experimental or the control conditions depending upon where the random assignment placed them. Parents who agreed to participate then completed the Parenting Stress Index; the total score obtained on this measure was used as a stratification variable in the random assignment. High stress was defined as a stress score above the 75th percentile as indicated in the test manual; moderate to low stress was a score below the 75th percentile.

As information was obtained on each subject in the program, this information was relayed to the on-site liaison who was not involved in providing services. The liaison recorded the information in the order in which it was received from the program. During a weekly phone contact with the EIRI site coordinator, children were assigned to the treatment conditions.

A chart with 18 categories was used to stratify subjects based on handicap and degree of parental stress. The nine columns in the chart represented the nine handicapping conditions described earlier. The two rows in the chart represented high parenting stress and moderate to low parenting stress. At the beginning of the study, it was specified that in certain categories the first child identified would enter as an experimental subject while in other categories the first child identified would enter as a control subject. This was done in order to facilitate obtaining equal numbers of subjects in the experimental and control conditions.

During a weekly phone contact, the child's handicapping condition and the mother's PSI score were used to determine the child's category. If the child was the first in a particular category, he or she was assigned to the experimental or control group as previously specified. The next subject which fell in that category was assigned to the opposite group; this assignment continued sequentially as subjects were identified. For the subjects in the speech/language and motor group, a 16 category assignment pattern was determined randomly, and subjects were assigned based on this pattern. Once group assignment was determined, the site liaison then informed the child's program and family.

As children were being referred independently by three separate programs, the only person at the site who knew the actual order of entry of subjects was the on-site liaison. This ensured that program staff did not have any knowledge of where a particular child who was identified might be placed. In addition, the dates on child information was reported were carefully tracked to ensure that children were assigned in the order in which they were identified.

Attrition: Seven children who were identified as subjects have since dropped from the study. Two children died, two moved out of the service area, and one child's custody was turned over to the Division of Family Services. One hearing-impaired child left the study because the parents sought treatment in a private center. One child from the expanded services group withdraw because the parent felt that 3 times per week services were too much for her to fit in to her schedule. This child continues to be served by the program once per week, but is no longer included as a subject in the study. Four of the children who withdraw from the study had been assigned to the expanded services group while three had been assigned to the basic services group. There does not appear to be any systematic pattern of attrition across groups.

INTERVENTION: As discussed under the section on program organization, this study is a collaborative effort involving three administratively and fiscally independent early intervention programs. Each program therefore has its own procedures for child find, assessment, staff supervision, and location of service provision. However, the basic level of service in each program, as described below, is comparable across programs.

Basic Level of Service: This basic level of service involves a once-per-week contact with a parent-infant educator. The contact can occur either at the center or in the child's home. Availability of transportation determines where the services are provided. Although analyses of the attendance data are not yet complete, it appears that the frequency of home versus center contacts is consistent across groups, with most contacts occurring at the center.

The primary goal of intervention in each of the programs is child development through direct service as well as through provision of information, support, and training to parents. Although the specific procedures for accomplishing this goal will vary as the result of the specific training and philosophical orientation of each of the educators, the overall emphasis on utilizing a family-focused intervention model is maintained across the programs.

The content of the parent-infant session is based on 1) recommendations made by the multidisciplinary or transdisciplinary assessment team, which typically includes a psychologist, speech/ language pathologist, OT/PT, educator, and the child's parent, and 2) jointly by the educator and the parent based on the child's progress over time. An Individual Family Service Plan (IFSP) or Individual Education Plan (IEP), is developed for each child based on this information and is used to guide the educator in working with the parent during the sessions. A variety of assessment instruments are utilized to develop the specific objectives in the IFSP. The SMA project has developed its own child assessment instrument which contains items selected from a variety of developmental tests, such as the Bayley Scales and Gesell. Staff have also developed and utilized a Parent Needs Survey to determine family goals for the IFSP. On the Lake-McHenry program, the Allied Developmental Profile is used to determine the child's current level of functioning as well as to identify general intervention goals. Educators also utilize additional assessment instruments as needed for a more in depth analysis of child functioning.

The Southwest Cooperative Program uses the Battelle Developmental Inventory (BDI) as an assessment instrument as well as a tool for planning the IEP. Additional assessment instruments are also utilized as needed. Assessment of family needs in the Lake-McHenry and Southwest programs occurs informally during the assessment process as well as in an ongoing manner during intervention.

The parent-infant sessions are conducted by parent-infant educators who are certified for birth to 3 in the State of Illinois. Many of the educators also have specializations in Physical Therapy (PT), Occupational Therapy (OT), Speech/Language

Therapy, or Psychology. Assignment of a child to an educator's case load is done by the supervisors in each program and takes into account the match between a particular intervenor's area of specialization and the child's needs. For example, a PT would be assigned as the educator for a child with extensive motor delays.

During an individual session, activities designed to address specific child goals are implemented. Specific teaching procedures are either developed by the educator or are drawn from a published curriculum, such as the Portage or the Early Intervention Developmental Profile. There is no one curriculum utilized across the programs, as educators are to select a curriculum which is appropriate for the child's needs as well as consistent with their training and orientation.

Parent concerns are also addressed during the individual sessions as specified in the IFSP. Parents are given the opportunity to discuss the child's progress since the last session, to ask questions about specific intervention procedures, to receive training in the implementation of specific teaching procedures, or to discuss any issues which they feel are relevant to their or their child's well being. Staff from all three programs have participated in a number of inservices during the year in order to improve their skills in implementing a family-focused intervention, including a presentation by Carl Dunst on the PEP model and by Pat Welge, M.A., on developing a functional IFSP.

Expanded/More Intensive Services: Children assigned to this group participate in three, one-hour contacts per week with a parent-infant educator. The content and focus of the sessions is the same as that for the current services group. The same process for identifying IEP and IFSP objectives is utilized. The increased staff contact time does, however, allow for a wider range of goals to be addressed for this group. Ideally, the three time per week contact also allows children to progress more quickly through IEP objectives. However, this is a question to be answered empirically.

OPTIONAL SERVICES: In each of the programs, a number of optional services are made available to families in both treatment groups. These services include activities such as a 10-week parent training group, monthly parent support group, or special presentations on selected topics. The extent to which parents participate in these optional services is monitored by 1) collection of attendance data, and 2) parent report of additional services at posttest. To date these data suggest equal participation in these activities by both groups. A list of the types of activities, the programs which provide them, and a preliminary analysis of the extent to which they are accessed by parents in the two groups is contained in Table III.9.

Table III.9

Preliminary Analysis of Optional Intervention Services Provided to Subjects in the Experimental and Control Groups In SMA/Lake-McHenry

Service	Lake McHenry	SMA	Southwest Cooperative	Percent of Families Accessing Service	
				Experimental	Control
Support Groups	X	X	X	30%	32%
Parent Training	X		X	17%	15%
Social Work Services			X	2.5%	3.5%
Presentations on Selected Topics	X	X		11%	12%

TREATMENT VERIFICATION: A number of procedures have been implemented in order to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data. The child's participation in the program is recorded according to the length of the session and the staff involved. Non-attendance at regularly scheduled sessions is also recorded according to the reason for non-attendance (e.g. child illness, holiday, etc.). Attendance data are summarized after 12 months of service. Data for 18 subjects who have been in service for 12 months are presented in Table III.10. These data indicate that children in the expanded services group attended sessions 2.6 times more frequently than children in the basic services

Table III.10

Comparisons of Child Attendance Rates After 12 Months for the Basic and Expanded Services Groups for SMA/Lake-McHenry Subjects

	Basic Services Group (n = 9)	Expanded Services Group (n = 9)
Average number of sessions attended over 12 months	28.78 (7.48)	75.00 (26.49)
Average number of sessions offered over 12 months	37.22 (4.84)	109.89 (25.79)
Percent attendance	77.00 (16.70)	67.44 (12.85)

group. Although the number of scheduled sessions was 2.95 times more in the expanded versus the basic services groups, percent attendance in the basic services group was somewhat higher than that in the expanded services group. Additional analyses of the attendance data as more children are posttested will be necessary for future examination of this trend.

2. Parent report of time. Parents in both groups complete postcards on a weekly basis which indicate a) how much time they spent with a staff member of the program, and b) how much time was spent working with the child on activities suggested by the program. These data have been coming in regularly, and are in the process of being summarized.

3. Parent ratings by staff at posttest. The child's case manager rates the parent in terms of attendance, knowledge, and support of program activities.

4. Site review. The annual site review, as described in more detail below, was conducted on May 7 and 8, 1987.

SITE REVIEW: A site visit was conducted on May 7 and 8 in order to review the treatment procedures being implemented by three programs participating in the Interagency Project for Early Intervention: Lake-McHenry Regional Program, South Metropolitan Association, and the Southwest Cooperative Association. Although these programs all provide similar services to birth to three children and their families they differ in their assessment procedures, development and implementation of IEPs, and in administration and management procedures.

A number of strengths were noted across all three programs. Although assessment procedures differed, each program utilized a comprehensive approach to assessment which involved professionals from a number of disciplines. Each program used assessment data to develop and implement individualized programs for each child. Each of the three programs also provided staff with the opportunity to select from a number of different curricula. This allowed staff to be flexible in IEP development for children with a wide range of skills.

Two areas for possible improvement were identified across all three programs. One area was the development and implementation of IEPs. Although each program was utilizing appropriate IEPs, there were some inconsistencies in the extent to which criteria for goal attainment, timelines, and methods for assessing goal attainment were specified. Recommendations were also made about ways to improve documentation regarding the curricula and lesson plans being utilized.

Another area where some improvement was possible was the need to get parents more actively involved in the parent-infant session. While staff are accomplished in working individually with infants, the ability to include parents as active partners in the intervention process requires further development. EIRI has arranged to provide technical assistance to the programs for purposes of improving IEP development and curriculum utilization, as well as increasing parental involvement in the parent-infant session. This technical assistance will help to refine what is already a good service program for children between birth and age 3. SMA/Lake-McHenry and Southwest Coop have strived to keep up with new developments in the field of early childhood special education, such as the increasing emphasis on making parents active partners in intervention. Staff of these programs thus feel that the technical assistance to be provided by EIRI is consistent with their desire to keep their intervention programs as consistent with current thinking in the field as possible.

DATA COLLECTION: Pretest. After children have been identified and assigned to groups based on their Wisconsin scores and the parent's level of stress as assessed by the Parenting Stress Index (PSI), a pretest battery consisting of the Battelle Developmental Inventory, Family Support Scale (FSS), Family Resource Scale (FRS), Family Inventory of Life Events and Changes (FILE), and the Family Adaptability and Cohesion Evaluation Scales (FACES III), is administered. The BDI is administered by a trained diagnostician who is unaware of the child's group assignment. Testing occurs at a center which is centrally located to the programs but is not the center which the family attends. This ensures that the testing setting is equally unfamiliar to all subjects. Mothers complete the family measures following the administration of the BDI, and are paid a $20 incentive for so doing. Married mothers and those with spouse equivalents are also given a copy of the Family Support Scale to take home for their husbands to complete. The diagnostician completes a testing report and then transmits it with all data to the local assessment coordinator who maintains copies of all of the protocols and submits them via certified mail to EIRI.

Posttest. Posttesting occurs 12 months after the child enters the program and then at 12 month intervals thereafter. For subjects in the SMA and Southwest Coop Programs, this means that, after accounting for a 3-month summer break, subjects will have participated in 9 months of treatment. The Lake-McHenry program provides a 6-week summer program, and thus over a 12-month period the subjects in this program will have the opportunity to receive up to 10-1/2 months of service. Participation in this summer program is optional, and not all children and families who are eligible to participate do so. Attendance data continue to be maintained during the summer session.

The posttest battery is administered in two separate sessions by a diagnostician who is naive to the subject's group assignment. The first part of the battery, which lasts between 1-3/4 and 2-1/4 hours, consists of the BDI, PSI, FILE, FRS, FSS, and FACES III. The second part of the battery, which lasts approximately 1-3/4 hours, consists of the Bayley Scales of Infant Development, Parent-Child Interaction Videotape, Parent Survey Form, Parent Report of Child's Health, and Parent Satisfaction with Services. Parents are paid a $20 incentive for session 1, and a $15 incentive for session 2. The Wisconsin Behavior Rating Scale is administered within two weeks of the second posttest session by the child's case manager.

The Bayley Scales were selected as a complementary measure in order to provide a more sensitive measure of potential gains in cognitive and motor functioning than that provided by the BDI. The parent-child interaction videotape is included to tap the effect of the program on the infant-mother relationship. The Wisconsin Behavior Rating Scale will provide additional information on the child's progress from the educator's perspective.

Assessment Management: Two local diagnosticians are trained to administer the pretest and posttest measures. One diagnostician has a master's degree in psychology, while the other has a bachelor's degree and experience as a parent-infant educator. One back-up diagnostician has also been identified and trained. Testing is scheduled directly with the diagnosticians by the secretary at the SMA program. Shadow scoring of 10% of the test administrations is conducted by another trained diagnostician who commutes from the Milwaukee area. Interrater reliability data reveal an average coefficient of .88.

DATA ANALYSIS: Pretest data for children entered as subjects in late May and June of 1987, have not yet been fully transmitted. All other pretest data have been checked, scored, and entered in the data set, and analyses of pretest group differences have been conducted. All posttest data received have been scored, checked, and entered in the data set. The small numbers to date have not allowed for analyses of group differences at posttest.

FUTURE PLANS: Year 1 posttesting is ongoing, as children are in service for 12 months. To date, 12 children have been posttested; data for all but 3 have been received. Diagnosticians for posttesting are the same as those for pretesting. It is expected that Year 1 posttesting will continue smoothly until June, 1988.

Continued funding from the State of Illinois will allow all children assigned to the 3 sessions per week condition to receive these expanded services through June, 1988. At the Year 1 posttest, a letter is being sent to all parents to summarize the results of the study to date and to request their continued participation over the next year. As children in both groups become three years of age, they enter public school programs. Data will be collected from the public schools on placement and achievement. In addition, more age-appropriate complementary measures will be used. Cost data for the program and its effects will continue to be collected and analyzed.

PHOENIX CHILDREN'S HOSPITAL
Projects #6 & #11 (Treatment Intensity and Age at Start)

COMPARISONS: 1) Brain Injured Children--Medical follow-up only versus medical follow-up plus home intervention; 2) Brain Injured Children--Medical follow-up plus immediate home intervention versus medical follow-up plus delayed home intervention

LOCAL CONTACT PERSONS: Raun Melmed, Director, PCH Child Development Center, (602)239-4225; Liza Cherne, Infant Services Specialist, Southwest Human Development, (602)266-5976

EIRI COORDINATOR: Chuck Lowitzer

LOCATION: Phoenix, Arizona

DATE OF REPORT: 9-8-87

The Phoenix Children's Hospital project is a three group comparison addressing two research questions: 1) Does more intervention produce significantly improved outcomes than less intense intervention with brain injured children?; and 2) Does home-based intervention provided immediately after hospital discharge produce significantly improved outcomes than the same intervention provided one year after hospital discharge of brain injured children? Thus, the first research question is one of treatment intensity, and the second is one of age at start of intervention. For purposes of clarity, both studies are described below. All children and families participating in the project will receive more services than are currently provided at Phoenix Children's Hospital.

RATIONALE FOR THE STUDY: Although a great deal of time and resources have been utilized to develop intervention programs for children who are discharged from neonatal intensive care units (NICUs), relatively little attention has been paid to those discharged from pediatric intensive care units (PICUs). This is true despite the fact that over the last 20 years, PICUs have impacted positively in the acute care of children with life-threatening problems. Problems served in PICUs include a wide variety of diseases and injuries such as multiple trauma, near-drowning, and severe meningitis. What has not been adequately established is the outcome of survivors who have been discharged from PICUs, nor, for that matter, have systematic attempts been made to follow such children, or provide them with appropriate early intervention services. In several studies (Bruce, 1983; Bresman, 1983; Herson, 1977), it was clearly evident that children between the ages of 0-3 years with head trauma, severe meningitis, and near-drowning episodes had the worst outcomes as compared to all children admitted to PICUs. In addition, the sparsity of studies done and lack of attention paid to this group was alarming, especially considering the number of the children and the severity of the problems.

Accidental trauma is the leading cause of death in children in the United States. Investigations of the outcomes of children surviving head trauma have shown that they have persistent and marked developmental decline following severe injury (Brink, 1980; Levine, 1983). Moreover, the 0-3 age group has shown a greater vulnerability than older children. In follow-up studies, only 5% of children who have sustained severe head trauma are shown to be performing within normal limits by the time they enter school (Gerrins, 1986).

Similar findings among victims of cerebral infections (including all severe infections of the central nervous system, of which meningitis is the most common) have been reported. Impairments include memory and motor difficulties, behavioral disturbances (Molnar & Perrin, 1983), and language concerns. Of course, less subtle abnormalities also occur, including neuromuscular dysfunction (spastic hemiparesis, ataxia, dyskinesia) and sensory deficits (impairments of position sense, hearing impairments, visual impairments, etc.). Problems such as seizure disorders, gastroesophageal reflux and endocrinological aberrations also need to be addressed in the rehabilitation process. These residual deficiencies range from personality changes to physical disabilities and require long-term intervention (Heiskanen & Kaske, 1974).

Finally, with improved management of near-drowning patients in PICUs, there is an increasing concern that survivors will manifest neurological disabilities at some later point (Oakes, 1985). Those children surviving warm water near-drowning episodes (such as those in pools) have a worse prognosis than those who were immersed in cold water (Frates, 1981). It was also shown that children admitted with a Glascow Coma Score (GSC) of three or less invariably displayed severe neurological sequelae. (The GSC is a measure of neurological functions of children who are comatose.) Fifty percent of those achieving a GSC of between 1-5 displayed similar problems. Most children scoring greater than 5 recovered normal neurological functioning, although subtle findings such as learning difficulties have not been investigated. The selection of a GSC rating of 8 for participation in this study was made with the intent of investigating these more subtle findings.

During 1986, there were 118 children under age 3 discharged from the Phoenix Children's Hospital Pediatric Intensive Care Unit as a result of near-drowning, multiple trauma, or severe meningitis. Although the majority of these children exhibit moderate to severe delays and disabilities which might be ameliorated by well-coordinated early intervention services, few of these services are currently available for children under 3, and almost none of this population access what services do exist at the current time. With respect to victims of traumatic injury in particular, Levin, Benton, and Grossman (1982) have pointed out that the notion that, "children are relatively impervious to cognitive impairments after such injury is clearly not supported by the available data" (p. 207). Although there is considerable variability with respect to areas of later deficit in the drowning and meningitis groups, it is clear that loss of function frequently continues long after the initial insult.

Thus, the concept of medical follow-up and coordinated early intervention services, which is well established and widely practiced for children discharged from Neonatal Intensive Care Units, is worthy of investigation with those discharged from

Pediatric Intensive Care Units. The question of whether medical follow up alone will result in levels of recovery similar to that obtained by children receiving more comprehensive services has not been addressed. Furthermore, although it is widely believed that children spontaneously recover normal neurological functioning after brain injury, data to support this belief are not available (Levin et al., 1982). The neglect of such study and intervention is alarming in light of the fact that a much higher percentage of the children from PICUs will exhibit delays and disabilities than those from NICUs.

Additionally, there are increasingly frequent questions about the cost-effectiveness of the various types and intensities of early intervention services per se. Legislators, policy makers, and practitioners are demanding better information about what type of early intervention program is most likely to be successful, at what age it should start, and how it could be provided. This study will begin to address these issues for victims of severe trauma, near drowning, and severe meningitis.

PROGRAM ORGANIZATION: Physicians and staff at the Pediatric Intensive Care Unit (PICU) at Phoenix Children's Hospital (PCH) treat seriously ill and injured children from throughout the state. Some 1,300 children per year are treated in the PICU. The Pediatric Specialty Care Center provides all related diagnostic and evaluation specialties, including Pediatric Neurology, Gastroenterology, Endocrinology, Pulmonology, Hematology/Oncology, Nephrology, and Pediatric Psychology. The Child Development Center at PCH provides developmental evaluation and diagnostic services for children and families under the direction of a developmental pediatrician. Except for routine follow-up visits to a neurologist or other physician after discharge, however, little has been done to coordinate medical services, and nothing has been done with respect to helping these children and their families overcome the often long-lasting effects of these injuries.

Southwest Human Development (SHD) is a non-profit human service agency that employs over 70 persons and is the largest service provider in the city of Phoenix. Many of the referrals received are from the PCH Child Development Center. The mission of the agency is to provide a continuum of high quality and consistent services to at-risk and handicapped children and their families. Direct service delivery to children and families via center and home-based programs, head start programs, diagnostic services, and consultation and training services to other agencies are among services available at SHD.

Under the auspices of the PCH Child Development Center and Southwest Human Development, all children and families who participate in this project will receive coordination and follow-up of medical services two weeks after hospital discharge and again each 6 months thereafter. Home-based, family centered intervention services will be provided by staff from Southwest Human Development. Specifics of these services are described under "Intervention." Although not all families will receive home-based intervention services, all children and families participating will receive more services than are currently provided at the PICU at Phoenix Children's Hospital.

The director of the Child Development Center at PCH (who is a developmental pediatrician) and the Infant Services Coordinator at SHD serve as project co-directors, and work together to coordinate subject identification and service provision.

SUBJECTS: Over the next 12 to 18 months, a total of 75 children and their families will be enrolled in the project, with 25 children per treatment group. Enrollment began during the last week of April 1987. To date, 14 children have been identified who meet these criteria and whose parents have signed consent forms. Six of the subjects are near-drowning victims, four are meningitis victims, and four are trauma victims.

Criteria for Inclusion: Children participating in this project are 0- to 3-year-old victims of severe trauma, near drowning, or severe meningitis who live within a 50 mile radius of Phoenix. Severe trauma is defined as a score of 20 or more on the Modified Trauma Index (MTI). The MTI is a measure of the child's functioning in several areas of physical response (e.g. state of consciousness, response to painful stimuli) that is taken at three times: the scene of the injury, the emergency room, and at arrival in the PICU. Ratings of 20 or more at all three sites are required for eligibility. Near-drowning victims must have a Glasgow Coma Scale (similar to the MTI) score of 8 or less at each assessment (although children with GSC scores above 5 have been reported to recover normal neurological functioning, a cutoff of 8 was chosen because subtle findings, such as learning and behavioral disabilities, have not been investigated with this group). Severe meningitis is determined by factors such as length of illness prior to hospitalization and length and degree of child's fever, and no child is admitted to the PICU unless the condition is considered severe.

Procedures for Identification and Assignment to Groups: The local project co-directors meet with PICU staff weekly to review new admissions to the PICU and identify potential study participants. As soon as PICU staff think the family is ready, one of the project co-directors approaches the family regarding the study, and solicits participation. Careful attention is paid to the family's emotional condition, and participation is not sought until project staff believe the parents are prepared.

For group assignment purposes, children in these studies are classified by injury group and medical condition at discharge (see below). The treatment groups are designated as follows: Group 1, medical follow-up plus home intervention; Group 2, medical follow-up plus home intervention provided one year after hospital discharge; and Group 3, medical follow-up only.

To ensure that personnel on site do not selectively provide child information based on some treatment preference or other bias, and to promote equality of group size, an assignment procedure was designed utilizing a six-sided die. The die is rolled (by the EIRI site coordinator) for the first child assigned to each injury group, based on the child's condition at discharge (i.e. mild [meaning ambulatory or with no intubations or external forms of life support], or severe), as illustrated below:

	Trauma	Drowning	Meningitis
Mild			
Severe			

This roll determines group assignment for the first three children in that group, as follows:

Results of roll:	Order of Group Assignment:
1	1-2-3
2	2-3-1
3	3-1-2
4	1-3-2
5	2-1-3
6	3-2-1

Thus, if the die roll results in a "1", the first child in that category goes to Group 1, the second to Group 2, and the third to Group 3. The die was again rolled with the fourth, seventh, etc. child assigned to each injury group/discharge condition.

EXPERIMENTAL INTERVENTIONS: Each of the interventions provided in this project represent an expansion of services currently provided to brain-injured children at PCH. Results of the project will thus influence future treatment strategies used both at PCH and elsewhere.

Medical Follow-up Plus Immediate Home Intervention Group: Children and families in this group receive medical follow-up services from the developmental pediatrician 2 weeks after hospital discharge and each 6 months thereafter. Prior to meeting with the families, information on the child's current condition and physician recommendations are gathered from the medical records and from direct interviews with each of the physicians who have treated the child. When meeting with the families, the developmental pediatrician reviews these data, assesses the family's understanding of them, and clarifies any misconceptions and areas that are not understood. Finally, he answers any questions family members have concerning the child's condition or any treatments the child is receiving. He may also provide service referral information at this time, should a family member request such information.

Home intervention services begin within 2 weeks of the first visit with the developmental pediatrician. The first objective of home intervention is the development of an Individualized Family Services Plan (IFSP). Home interveners assess the child's current functioning, learning, and environmental and social interaction patterns. An assessment of parent/child interaction patterns is also conducted. Based on results of these data, the project's pretest measures, and on extensive family input, the IFSP is completed. Components of the IFSP include: a) play and learning objectives in the areas of self-help, fine and gross motor, communication, cognition, and social skills; b) activities to build on family strengths and improve areas of need in the family; c) a listing of barriers preventing effective acquisition of services for the child and family; d) a listing of family concerns regarding the child's medical condition and procedures to address these concerns; and e) specification of the pattern and schedule (frequency) of continuing home intervenor visits.

A typical home visit proceeds as follows:

9:00 - 9:15 Warm up and casual observation of parent child interactions.

9:15 - 9:30 Review of needs noted at prior meeting and development/revision of the IFSP.

9:30 - 10:00 Demonstration of strategies to be used by parents in developing and assessing child skills, focusing on parent-child interaction patterns.

10:00 - 10:30 Intervention specialist provides feedback on parent performance. Ongoing and newly identified service needs are reviewed. Intervention log is updated.

Learning activities are developed based on an appropriate developmental curriculum. The Hawaii Early Learning Profile, the Portage Project curriculum, and the Early Intervention Developmental Profile are currently being evaluated by project staff, and one will be selected for use with study participants by October 1, 1987. Additionally, activities developed for specific medical/developmental needs of children are integrated in the individualized home-based treatment program for each child and family. Supervision and coordination of home intervention programs are being provided by the Intervention Services Coordinator. The home intervenor is an R.N. with a Master's degree in counseling and extensive experience working with handicapped children and their families. Parents are encouraged to attend support group meetings, which are conducted in conjunction with the Pilot Parents Program in Phoenix.

Medical Follow-up Plus Delayed Home Intervention Group: Children and families in this group receive only the medical follow-up services described above for the first year after hospital discharge, after which the above home intervention procedure will be added.

Medical Follow-up Only Group: Children and families in this group receive only the medical follow-up services described above, which are provided after the child is discharged form the hospital.

Additional Services: Additional services available in the community may be recommended by project staff or sought independently by project participants. These include such things as speech therapy, occupational and physical therapy, consultation with a home nurse, individual and/or family counseling, and day care/respite services. The extent to which parents participate in these services, as well as the type of services received, is monitored by the home visitor and by parent completion of the Additional Services form at posttest. Should parents receiving medical follow-up only access additional services to a greater extent than those receiving home intervention, it will be important to ask why they sought those services and from whom they received there referral information. Answers to these questions will clarify the degree to which study participation has influenced this outcome.

TREATMENT VERIFICATION: A number of procedures have been implemented in order to verify that treatment is being implemented as intended. They include:

1. Collection of compliance data: Participation in the program is recorded with respect to the number of physician and home visit appointments kept and missed and by home intervenor ratings of parent understanding and implementation of the child and family program.
2. Home intervener evaluations: Home interveners will be evaluated with respect to their performance in child and family evaluations and their teaching/intervention skills with both the child and the family.
3. The Additional Services Form: Parents will complete an Additional Services Form at posttest. The form will be administered in an interview format that seeks information about services beyond those provided by project staff the family has received, as well as how often and how much service was received.
4. Parent involvement data: Parents in the home intervention group will be called every other month and asked to estimate the amount of time per week they spent working with program staff and how much time per week they spent working with their child on activities suggested by program staff. For comparison purposes, parents not receiving home intervention will be called once each six months and asked the same questions.

SITE REVIEW: A formal site review will be conducted annually by the EIRI site coordinator, the project co-directors, and at least one participating parent. The purposes of this review will be to assess the extent to which project personnel are delivering interventions as intended, the extent to which group treatment differences are being maintained, and to identify program strengths and areas in which technical assistance would enhance service delivery. Areas addressed in the review include services to children, interactions between staff and study participants, curriculum, administration and management, and physical arrangements. The review is accomplished by review of project records (e.g. IFSPs), interviewing partipating staff and families, and observation of project activities. Finally, the EIRI coordinator writes a summary of the review findings for distribution to project staff, who then act on recommendations stemming from the review.

DATA COLLECTION: Data are being gathered that assess the impact of the various interventions on both the child and the family. Using an array of family measures and collecting demographic information will enhance the generalizability of the results and reflect the systems theory approach on which these studies are based.

Pretest. The pretest battery consists of the Battelle Developmental Inventory (BDI), the Parenting Stress Index (PSI), Family Support Scale (FSS), Family Resource Scale (FRS), Family Inventory of Life Events (FILE), and the Family Adaptability and Cohesion Evaluation Scales (FACES), and is to be administered within 4 weeks of assignment to groups. Problems in diagnostician recruitment and certification have resulted in a delay with the first six subjects assigned, but these problems have been overcome and all current subjects will be assessed as intended. Parents are paid a $10 per hour incentive for testing.

Testing is conducted by a trained diagnostician who is unaware of the child's group assignment. Administration of the BDI is conducted in a testing room provided by Southwest Human Development unless the child is medically fragile, in which case testing is conducted in the child's home. Mothers complete the family measures following administration of the BDI, and fathers (when possible) complete the Family Support Scale only. If the father or other male is present in the home full time but is not at the testing session, mothers are given a copy of the Family Support Scale to take home for him to complete. The diagnostician completes a testing report and transmits all data to the assessment supervisor, who checks the scoring accuracy, copies all protocols, and transmits the originals to EIRI via certified mail.

Posttest: Posttesting occurs 12 months after pretesting for all participants, and is administered by the same set of naive diagnosticians, but not necessarily the same diagnostician, who administered the pretests. Additional posttest measures include the Bayley Scales of Infant Development or the Stanford-Binet, depending on the child's age, the Carey Infant Temperament Scale, a neuro-developmental assessment by a neurologist, and the CESD. These instruments were chosen because they are widely used in the medical literature as outcome measures and because they will provide added information with respect to sources of child and family stress. Mothers will also complete the Parent Survey Form, the Parent Report of Child's Health, the Additional Services Form, and the Parent Satisfaction with Services Form.

Assessment Management: A local diagnostician who holds a master's degree in education is trained to administer the standard pretest and posttest measures, and one or two additional diagnosticians are being sought. A second diagnostician, who is currently a graduate student working with EIRI, will be moving to the Phoenix area in October 1987, and a possible third diagnostican has been identified by faculty in the educational psychology department at Arizona State University. This third person is a doctoral student in educational psychology. A local assessment supervisor who is a Ph.D certified psychologist was identified by the developmental pediatrician at PCH. Testing is scheduled by the diagnostician in coordination with the assessment supervisor, who shadow scores 10% of all test administrations for each diagnostician.

To ensure that diagnosticians are naive as to subject group assignment, project staff provide the assessment coordinator with information regarding the child's age and medical condition only. Age and medical data are important in that they are used to determine whether the child can be tested at PCH or must be tested at home, and the data also help the diagnopstician prepare for the test. The coordinator then contacts a diagnostician, gives the medical information, and asks the diagnostician to contact the family to schedule testing.

DATA ANALYSIS: No analyses have yet been performed on data from currently enrolled subjects. Data that have been received are being cleaned and coded for computer entry. Battelles are being checked for scoring accuracy (i.e. addition checks and proper use of basals and ceilings), and parent measures are being checked for omissions (notes are made as to what omissions there are how they are handled) and scored. Data analysis will begin when thirty subjects have been assessed and their data entered and cleaned. Correlations between family demographics, Battelle data, and parent measures will be conducted at this time, as will t-tests between intervention groups. Inclusion of demographic data will enhance the generalizability of our results by allowing us to control for systematic differences between groups on the demographic variables.

FUTURE PLANS: Over the next year, no changes in our methods are anticipated. We will continue to enroll children and monitor and refine the child referral process on the PICU to ensure that eligible children and families are not missed. We will also use this time to establish and develop working relationships with additional community service providers, and to refine our Individualized Family Service Plan procedures and products. Intervention will continue until the child is kindergarten age, or until the final IFSP goal of service independence has been achieved.

Finally, at the end of the first year, we will conduct an economic analysis of the costs of each intervention strategy. This will include all program costs, such as staff time and facilities, parent time, and costs of intervention materials. Costs will then be compared with all program benefits, including those to the child and to the families. This data will be important to both policy makers and program developers.

SALT LAKE CITY IVH PROJECT
Project #7 (Age at Start)

COMPARISON: Grades I, II, III, and IV Intraventricular Hemorrhage Infants (IVH)--Services begun at 3 months adjusted age vs. services begun at 18 months adjusted age

LOCAL CONTACT PERSONS: Teri Wingate-Corey, Utah State University
Gary Chan, University of Utah Medical Center
Jack Dolcourt, Primary Children's Medical Center

EIRI COORDINATOR: Teri Wingate-Corey

LOCATION: Salt Lake City, Utah

DATE OF REPORT: 9-8-87

RATIONALE FOR THE STUDY: Since the implementation of PL 94-142, an act which made provisions for educational assistance to all handicapped children, there has been a dramatic increase in the availability and quality of services for handicapped infants and children (Mulliken & Buckley, 1983). This increase has been accompanied by a heightened public awareness of the importance of treating the individual once a handicap has been identified, and of directing efforts toward earlier identification, prediction, and prevention of such conditions (Hunt, 1980). With Public Law 99-457 mandating early preschool services, it is anticipated that public and professional interest will continue to grow.

Our current ability to identify and appropriately treat children who are at risk for developing various handicapping conditions is limited (Mulliken & Buckley, 1983). Thus, research aimed at developing early diagnostic techniques and differential intervention programs for infants at risk for handicaps needs further attention.

One little explored, yet potentially important, indicator of later handicapping conditions is the occurrence of cerebral intraventricular hemorrhage (IVH) during the first few days of life in low birth weight (LBW) and, on rare occasions, full-term infants (greater than 2,500 gr).

Approximately 10% of all infants born in the U.S. are premature with low birthweights, and 31-55% of these infants suffer IVH (Ahmann, Lazzara, Dykes, Brann, & Schwartz, 1980; Bowerman, Donn, Silver, & Jaffe, 1984). As noted previously, IVH also has been observed on rare occasion in full-term normal birth weight (NBW) infants (Fenichel, Webster, & Wong, 1984) as well as in utero (Hill & Rozdilsky, 1984). Thus, IVH has come to be known as one of the major health problems in the newborn intensive care unit (Pasternak, Groothuis, Fischer, & Fischer, 1983).

Of infants who suffer IVH, an estimated 50-60% survive (Volpe, 1981). However, information on the future developmental progress in this population is limited and controversial (Hynd, Hartlage, & Noonan, 1984). For example, Williamson, Desmond, Wilson, Andrew, and Garcia-Prats (1982) found that 29% of IVH Stage One and Two LBW infants exhibited moderate handicapping conditions by the age of 3, whereas Papile, Munsick-Bruno, and Schaefer (1983) found that only 15% of such children could be diagnosed as having these handicaps. Both Papile et al. (1983) and Williamson et al. (1982) found that up to 80% of premature LBW survivors who experienced Stage Three or Four IVH demonstrated moderate to severe handicapping conditions, such as cerebral palsy, by the third year of life.

One frequent conclusion of previous research in the area of early intervention with at-risk or handicapped infants and children is that screening and intervention should be initiated early in life (Mulliken & Buckley, 1983). Although there is a fair amount of research with premature low-birth-weight babies (see Bennett, 1987; Casto et al., 1987; Cornell & Gottfried, 1976; Klaus & Kennell, 1982; Masi, 1979; Ramey, Bryant, Sparling, & Wasik, 1984; for reviews), most have focused on in-hospital stimulation or parent training as opposed to an intervention based upon a child's individual needs, and virtually all have excluded children who have suffered major neurological insults such as IVH.

Casto et al. (1987) reviewed 29 primary research studies which assessed various interventions for preterm infants weighing under 2000 gr. The studies were evaluated using meta-analysis techniques. The authors noted that although studies reporting short-term interventions on a small sample yielded the largest effect sizes, long-term evaluation of the impact of treatment was not evaluated. Furthermore, outcome measures utilized, such as weight gain and various sleep indices, have not yet been validated as important predictors of development past the neonatal period. They suggested that further investigations on intervention efficacy eliminate restrictive inclusion criteria. Infants in nearly all studies reviewed were free from serious medical complications, including neurologic impairment such as IVH. Thus, the infants most likely to be high-risk for developmental problems were not included in the intervention studies.

At issue is the age at which intervention should start for infants who have serious medical problems and who routinely spend up to three months in intensive care units. Since these infants currently receive only medical follow-up, this study provides a good opportunity to test the age-at-start hypothesis. EIRI staff have worked closely with this program in the past, and thus anticipate an excellent working relationship for this longitudinal study. It provides a rare opportunity for a high degree of replication of another study (Project 11), but with sufficient variation in the intervention to illuminate some of the parameters regarding the optimal level of intervention program for which theory provides no clear guide. From a systems theory perspective (Ramey, MacPhee, & Yeates, 1982), it will be important to document how education, social service, and medical systems interact with each other and how each in turn affects the family system.

PROGRAM ORGANIZATION: Prior to this research project, the services to these infants included neonatal care at the respective hospitals and referral to the Utah State Department of Health Neonatal Follow-Up Clinic or follow-up from private physicians. Previous funding for these services were provided by the Utah State Department of Health. However, those parents who did not access the NICU follow-up clinic paid for services themselves. This remains the standard level of care for all infants released from an NICU in the treatment area. Subjects in the delayed intervention group receive no other services associated with this project until they are 18 months of age. However, parents are free to access other services in the community if they desire. Parents are queried about services they have accessed during the time period of the study.

The current program of services begins with referral to the project by the University of Utah Medical Center and Primary Children's Medical Center, who initially contact the parents and refer the interested parents to the site coordinator. Once a child is enrolled, the project provides a package of services delivered by independent providers, including a licensed physical therapist, a child development specialist, and trained developmental examiners. The services provided by these professionals are coordinated by the EIRI site coordinator.

SUBJECTS: There are currently 46 children between 3 and 27 months of age (age corrected to 40 weeks to control for prematurity) enrolled in the study. Subject recruitment will continue through January 1987, at which time it is expected that 60 subjects will be enrolled. The current sample is composed primarily of White infants from both urban and rural areas.

Information has been gathered by questionnaires regarding the family income, ethnic background, parent occupation, number of siblings, and primary caretaking responsibilities of the participating families. Most of the children are from families who are residing in the urban area surrounding Salt Lake City. Ninety-one percent of the families live in the Salt Lake City area, while 9% live in rural areas of Utah, Wyoming, or Colorado.

The ethnic background of the participants is largely caucasian (100% of the fathers are caucasian and 90% of the mothers are caucasian). All of the participants live in homes where English is the primary language. The educational level of the

McCarthy Scales of Children's Abilities (McCarthy, 1972). The McCarthy Scales serve as a single instrument to assess a child's developmental level in the cognitive, motor, memory, and language areas. The test has been standardized for children from 30 months to 8-1/2 years.

Standardization was completed on a sample of 1,032 children from 2-1/2 to 8-1/2 years of age. The sample was stratified according to the 1970 census. Test-retest reliability is reportedly .89 to .91 for the General Cognitive Index and .69 to .78 for the Motor Scale (the lowest subscale reliability). Validity estimates are reported with the Stanford-Binet Intelligence Scale (.81) and the Wechsler Preschool and Primary Scale of Intelligence (.63 with WPPSI Verbal IQ, .62 with WPPSI Performance IQ, and .71 with the WPPSI Full Scale IQ).

To supplement the information gained in the McCarthy, other brief assessment instruments could be used. For example, to determine the child's handedness and fine motor ability, a finger tapping test could be administered. Memory could be assessed by using the Categories Test (Reitan & Danison, 1974). Other sensory, tactile, or perceptual tests may be added if time and resources allow. In addition, an academic test could be added to the battery when the child reaches school age.

In addition to the assessment instruments which may be utilized, plans for the future include analyzing the costs and benefits of an early intervention program with infants who are at-risk for handicaps, such as this IVH population. With appropriate data, a comparison can be made regarding costs and benefits of each intervention phase of this study.

mothers range from high school graduate to college graduate, with a mean education level of 13 years. The fathers' education level ranges from high school graduate to Ph.D, with a mean of 14 years of education. Annual family incomes range from $5,000 per year to over $50,000 per year. Median yearly income for the families is approximately $22,500.

Criteria for Inclusion: Infants qualify for participation in the study if they have been a patient in a Neonatal Intensive Care Unit (NICU) at either Primary Children's or University of Utah's Medical Center, if they have experienced perinatal intraventricular hemorrhage (IVH) and if they reside in the catchment area for treatment. Subjects are matched on severity of hemorrhage and birthweight prior to being randomly assigned to experimental or control groups. Severity of IVH is divided into mild (grades I and II IVH) and severe (grades III and IV IVH) categories. Infants with birthweights less than or equal to 1000 gr and those with birthweights greater than 1000 gr are matched with similar infants, prior to random assignment.

Procedures for Identification and Assignment to Groups: Subjects who meet the inclusion criteria are identified upon discharge from the respective NICU. Parents of eligible infants are contacted by mail by the appropriate NICU the month prior to their reaching 3 months corrected age[1]. For each infant who meets the study criteria, parents must indicate willingness to participate in one of the two experimental conditions, depending upon where random assignment places them. Infants are randomly assigned to the early intervention or delayed intervention conditions by a roll of a four-sided die after stratification by severity of IVH (mild or severe) and birthweight (under 1000 gr or over 1000 gr). Parents are informed of their infant's assignment after they give approval to participate in the study.

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[1] In other words, a child who is born 4 weeks premature would not reach a corrected age of 12 weeks until 16 weeks after birth.

The only person at the site who knows the actual order of eligibility and enrollment of subjects is the EIRI site coordinator. In addition, the dates on which infants were assigned are carefully tracked to ensure that infants are assigned in the order in which they were eligible for initial pretesting.

Subject Attrition: There have been 48 children enrolled in the study to date, however, one child died prior to pretesting, and one child moved and could not be located by the project coordinator or hospital social workers. Many of the children have medical concerns which necessitate returning to the hospital for a period of time, yet the study has shown success in assessing infants on schedule and has had less than 5% attrition. The rate of attrition is being monitored, and assessment will be made regarding the rate of attrition in the two experimental groups, and whether attrition rate varies for children from different socioeconomic backgrounds or family situations.

To attempt to keep the attrition rate low, the intervenors and site coordinator in this project maintain updated telephone numbers and addresses for the participants. A semi-annual newsletter is sent to all participants. Data is collected in person or by mail approximately every 6 months for the child's first 18 months and monthly after 18 months, so there is frequent contact with the family. Arrangements have also been made to provide intervention services and assessment for those participants who move to another state.

INTERVENTIONS: The interventions are in two phases for this project. The first phase, early intervention, provides sensorimotor intervention to a randomly selected group, while a control group receives the current level of community service (referral to the NICU follow-up clinic). The second phase, delayed intervention, begins when the infant reaches 18 months corrected age and consists of home- and center-based intervention services for all children. Both early intervention participants and control group participants receive intervention services in the delayed intervention phase.

Early Intervention Service: The current level of service to subjects in the early intervention group (i.e., between 3 and 18 months corrected age) is a bi-monthly one-hour session with a licensed physical therapist. The therapist works with the infant and parent utilizing the motor intervention materials from the Curriculum and Monitoring System (CAMS).

The Curriculum and Monitoring System (CAMS) (Casto, 1979) was designed to meet the educational needs of young handicapped children. With training, the CAMS can be used by parents, teachers and paraprofessionals in the home or in an institutional/school setting.

The CAMS programs were published and are now disseminated nationwide. Each of the curriculum programs is printed in an easy-to-use block style design and bound in a notebook. This format was selected to allow persons administering the program to photocopy individual pages for use by the parents or trainers working directly with the children. The five CAMS Programs are: (a) receptive langauge, (b) expressive language, (c) motor development, (d) self-help skills, and (e) social-emotional development.

The **Receptive Language Program** teaches the student skills that do not require him to talk but are necessary in the understanding of oral language. Skills include identifying objects, following commands, and touching body parts.

The **Expressive Language Program** teaches children general speaking skills, beginning with the formation of sounds and proceeding through the development of simple grammatical sentences. It focuses on language-building articulation.

The **Motor Program** is designed to teach gross and fine motor skills to children who have delayed motor skill development. The program stimulates normal motor development patterns, beginning with raising the head and proceeding through running, hopping, and drawing squares and diagonals. This program is intended for children with mild to moderate impairments.

The **Self-Help Program** is designed to teach basic social-emotional skills to both normal and developmentally delayed children. The developmentally sequenced program begins with teaching a child to respond to a person and proceeds through teaching him to handle frustration and exhibit self-control.

The **Social-Emotional** Program is designed to teach basic social-emotional skills to both normal and developmentally delayed children. The program which is sequenced developmentally, begins with teaching a child to respond to a person and proceeds through teaching him to handle frustration and exhibit self-control. A placement test is administered for each area to determine which objectives should be offered to the child.

The CAMS placement test identifies areas of developmental delay in the motor, social-emotional, self-help, receptive language, and expressive language domains. A child development specialist administers the placement test and determines developmental level and appropriate goals for intervention in each domain. Parental concerns are also considered in developing intervention goals.

The objectives of the program are developmentally sequenced beginning at birth and extending to five years of age. The physical therapist assesses the child's intervention needs using the CAMS Motor placement test. The physical therapy consists of development of sensorimotor function in the specific area(s) of need. For example, if the child displays a motor weakness on the left side of the body, the physical therapist focuses on increasing strength in that area. Clearly, children will have different levels of need, and the therapist individualizes treatment.

A typical intervention session would include the therapist working with the child with the parent present. The physical therapist also instructs the parent on exercises that the child can do at home, and the parent practices and demonstrates competence on the exercises before the parent begins home intervention.

The parents are told to work with the child at home at least 20 minutes per day, 5 days per week, on techniques they have learned in the intervention sessions. The physical therapist telephones the parent on weeks they do not meet to answer questions and provide guidance on implementation of intervention techniques.

Parents record the time spent with the child initiating the CAMS intervention. According to preliminary data, 90% of the parents in the early intervention program are completing the assigned time requirements, and providing accurate records of their intervention sessions. For those few parents who are not following the intervention criteria, the physical therapist has maintained careful records of telephone calls and appointments made to get program compliance. The level of parental intervention and program involvement will be used in analyzing the outcome for the children to determine if level of parent involvement affects developmental outcome of the child.

Attendance and progress are monitored on an ongoing basis by the physical therapist's progress notes and the CAMS placement test checklist is updated as goals are met. If a child requires other equipment or services, for example, a child needs a walker or the family needs financial assistance to buy rehabilitation equipment, the physical therapist refers the family to agencies in the Salt Lake City area or attempts to obtain equipment no longer being used by other children. The physical therapist also keeps a supply of equipment which she provides to parents on a no-cost basis.

Through the process of monitoring and assessment, children are identified who require less intensive intervention. Some children may only require one session per month with the physical therapist. This once per month visit is considered the minimum required service since the physical therapist must assess the parents' intervention and the child's progress and needs. The parent continues home intervention 20 minutes per day, 5 days per week, and the physical therapist telephones on weeks in which the child does not receive an intervention session.

Delayed Intervention: At 18 months corrected age, all infants begin intervention services. The focus of intervention becomes center- and home-based for both early intervention and delayed intervention children. Therefore, all children at 18 months corrected age are assessed using the CAMS and goals are established for intervention.

The child development specialist meets with the parent and child for one-hour once each month and provides intervention in the area(s) of need identified by the CAMS placement test and parent concerns. The parent is asked to spend 20 minutes each day, 5 days each week providing similar intervention with their child at home. The child development specialist calls the parent via telephone weekly between clinic appointments to check on progress and answer questions.

When home intervention begins, the child development specialist establishes goals for the child dependent upon the CAMS placement test. In the session, an objective is determined for the child, and the specialist models the training objective to the parent and has the parent demonstrate. The parent keeps a log of the time spent training the child during the week. When the specialist returns, she has the child demonstrate the new behavior, if the child demonstrates competence in that area, a new objective is chosen and modeled for the parent.

For example, the objective for a child may be to point out facial features. The specialist will teach the parent an exercise to teach the child facial features. When the next meeting occurs, the specialist has the child point out facial features. If the child shows competence in that area, a new objective is established. Some children have objectives in several domains, others may have only one area of delay. The specialist also provides recommendations to parents regarding problems or concerns such as toileting or behavior problems of the child.

Parents are also encouraged to enroll their child into appropriate center-based programs in their community. The child development specialist has knowledge regarding community service agencies and refers parents to those agencies, where appropriate. The specialist then adjusts the home-based services to supplement the community-based services the child is receiving.

If a child in the delayed intervention group is identified by the placement test as having a motor delay, s/he will be referred to the physical therapist for motor intervention. Those children in the early intervention group who still require motor services will continue meeting with the physical therapist. If a child who has received motor services in the early intervention group no longer requires those services, s/he will terminate services with the physical therapist and receive center and home intervention only. The physical therapist follows the same procedures outlined in the early intervention service section.

In summary, all children begin individualized intervention services at 18 months corrected age. These individualized services will continue, and assessment will occur yearly until the child reaches 7 years of age. Some children may also obtain other services in the community. The access of services by the family is monitored on a yearly basis by having the parent complete an "additional services form."

TREATMENT VERIFICATION: A number of procedures have been implemented to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data. Both home visits and clinic visits are recorded. Phone contacts also are noted in the subject's chart by both the physical therapist and child development specialist. For the delayed intervention group, statistics regarding utilization of the NICU follow-up service is obtained from that agency. Currently, only 2% of the children referred to that service utilize the service. The early intervention group has shown good attendance, with 90% of the parents attending the intervention sessions regularly. Currently, this reflects only two parents who have not attended scheduled sessions.

   Since the physical therapist and child development specialist record all appointments, attempted contacts and actual contacts made, data can be analyzed regarding level of attendance in intervention sessions and the child's developmental outcome.

2. Parent report of time. Parents complete a daily log of time spent working at home with their infant on activities suggested by the program. Theses records are collected by the intervenor and sent to the EIRI site coordinator for recording on a monthly basis. Initial data indicates that 90% of the parents in the early intervention group are spending the recommended intervention time with the child. Analysis of videotapes of parent/child interaction will provide information on the judged quality of the parent intervention.

3. Site review. A formal site review is conducted annually.

SITE REVIEW: A site visit of the Salt Lake City IVH project was completed on May 22, 1987. Those participating in the site review included the site coordinator, the physical therapist, and child development specialist, and a parent representative. The purpose of the review was to collect information about the nature and quality of early intervention services that are being delivered, to verify that the research being conducted by EIRI is being implemented as intended, and to collect needs assessment data which may be useful to site administrators.

The treatment verification process, as described in the Treatment Verification Handbook for Research Sites (EIRI, 1987), was followed and implemented according to the general procedures described in the guide for Site Reviews of EIRI Research Sites, which is found in Appendix A of the handbook.

Data Collection Procedures: Findings of the site review were based on the following specific data:

1. The site review took place at the office of the physical therapist and child development specialist where the sensorimotor and expanded Curriculum and Monitoring System (CAMS) intervention is delivered. Intervention also is delivered in the home if the infant cannot be transported safely, such as when they require oxygen therapy.

   The team felt that the review of the center-based site was reasonably representative of the overall services offered in the early intervention service. Children are now beginning to enter the delayed intervention service.

2. The cumulative folders of six infants who were participants in the research study were examined by members of the review team. Three of the infants whose folders were examined were in the early intervention group and three were in the delayed intervention group.

3. The review team made direct observations of sensorimotor intervention activities with one infant, his mother, and the physical therapist intervenor. Videotapes of intervention and assessments also were reviewed.

4. The team also considered information derived from intervenors and parents.

Findings. Implementation of the intensive intervention program has significantly changed how services are delivered to experimental subjects, therefore, findings for the intensive intervention condition were different than findings for the control group condition. The services delivered to the subjects in the intensive intervention condition were superior to those received by control subjects.

The following section contains a summary of observations related to each of the five components that were evaluated in the site review.

Services for Children. The team found that the SLC-IVH center had a written statement of its theoretical/philosophical approach as well as an explicit statement of goals and objectives for infants and children served. There were appropriate service eligibility criteria and children being served met those criteria. Assessment procedure criteria likewise had been met. Appropriate intervention plans had been developed and monitored closely for each infant in the intensive intervention program, and procedures for assisting an infant's transition into another program were in place.

Interaction Among Staff and Children. In general, interactions among staff, infants and parents were positive, nondiscriminatory, and appropriate for the infant in both the early and delayed intervention conditions. The site review team found that staff used appropriate disciplinary methods and they were observed to encourage appropriate use of language and prosocial behaviors.

Curriculum. The intervention staff were observed to utilize the CAMS curricula consistently and were planning goals based on assessment of individual need as well as parent's input. The skill sequences in the curricula extend beyond the infant's current level of functioning. Educational materials necessary to carry out the curricula were available and individualized, as appropriate.

Administration and Management Component. The personnel involved in the intervention program have been evaluated directly while providing interventions and assessments. In addition, feedback from parents via telephone has been obtained. The project has a written statement of procedures for informed consent, due process and assurance of confidentiality and it was felt that staff were qualified and present in sufficient number to ensure adequate supervision.

Physical Arrangements. The center environment was safe, clean, and appropriate to the population served. Space was arranged to accommodate the infant and parent and a variety of age appropriate toys, equipment and furnishings were available.

Summary. The mean rating scores for each of the five key criteria areas evaluated as part of the current site review was 2.0. Based on these findings, no major changes in the program are recommended. At present the intervenors are attempting to gather parent home involvement data. After a 3-4 month period this information will be evaluated for completeness and usefulness. At that time further recommendations for collecting this data will be made.

DATA COLLECTION: Data is being collected for this study to determine the effects of intervention upon the child and the family. The assessment instruments have been chosen to provide some consistency of data collection across sites, but also provide information about children with intraventricular hemorrhage at birth and the unique experiences of their families.

Pretesting is done by the child development specialist, who does not know the group assignment of the child. Since there is a chance that the specialist could find out a child's assignment by posttesting, posttest diagnosticians were chosen who have no involvement with the project or the intervenors. In this way, the diagnosticians are "blind" to the child's original group involvement in the study.

Pretest. At 3 months corrected age (prematurity corrected to 40 weeks plus 3 months) all infants are tested with the Battelle Developmental Inventory (BDI), and the parents complete the Parenting Stress Index (PSI), the Family Support Scale, (FSS), the Family Resource Scale (FRS), the Family Inventory of Life Events and Changes (FILE), and the Family Adaptability and Cohesion Evaluation Scales (FACES III). All test and questionnaire protocols are sent to the EIRI site coordinator for scoring and placement in the EIRI file. Parents are paid $20 for their time in completing the evaluation session. This battery of tests provides information regarding both the infant's developmental level and early family reaction to the new born.

Interim Testing: When infants are 6 months corrected age, their parents are mailed the Carey Infant Temperament Scale to complete. This questionnaire is returned directly to the site coordinator via postpaid mail. Parents are paid $10 for their time in completing the questionnaire.

The Carey Infant Temperament Scale assesses the parents' estimate of the infant's temperament. Scoring categorizes the infant into easy, intermediate, slow-to-warm, and difficult categories. This information will be compared with the ratings of the videotaped parent/child interaction to determine if the child's perceived temperament affects interactions with the parent. The videotapes of parent-infant interaction and one of motor development are completed when the infants are 12 months corrected age, by a trained child development specialist or a licensed physical therapist. These videotaped sequences are rated by trained individuals who are "blind" to the study design and subject assignment to experimental conditions. Parents are paid a $10 incentive for videotaping.

The videotape of motor functioning follows a specific script. The motor script has the child perform the following behaviors (based upon the child's level of motor development): reaching and grasping from a supine position, rolling over and reaching and grasping from a prone position, creeping and crawling, sitting and reaching, pulling self up to stand, walking, and squatting to pick up a toy.

The parent-child interaction videotape involves the parent and child in play activities. In the first section, the mother and child play together for 15 minutes "as they would at home." Then for one minute the parent encourages the child to put the toys away. For the next two minutes, the parent reads to the child. Then the parent leaves the room for 45 seconds, and taping continues for two minutes after the parent returns to the room.

Posttest: Posttesting occurs at 18 months corrected age and annually thereafter. The child is given the BDI and the parent completes the PSI, FILE, FACES III, FSS, FRS, a survey of additional services received by the child in the last year, a report of child health during the last year, and a parent socioeconomic survey. Parents are paid $20 for completion of the evaluation.

The posttest data provides information regarding the child's developmental change in the first 18 months (and yearly thereafter), and the effect of intervention services upon the child's development. Change in the family during this time, including socioeconomic changes can be determined.

Assessment Management: Four local diagnosticians are trained to administer the pretest and posttest measures. One diagnostician has a Ph.D in psychology, one is a Ph.D. candidate in psychology, one has a master's degree in special education and the other has a master's degree in family and human development, in addition to holding a physical therapy license. Testing is scheduled directly with the diagnosticians by the site coordinator. Shadow scoring of 10% of test administrations is conducted by another trained diagnostician who commutes from Logan, Utah. Interrater reliability indicated that the diagnosticians are administering the tests with a reliability level above .90.

DATA ANALYSIS: The initial focus for this study was through 12 months corrected age. Twenty-four infants were initially involved in this pilot study (10 in the experimental group and 14 in the control group).

This study was conducted for the purpose of examining the relationship between early sensorimotor intervention and developmental outcome of infants with perinatal IVH. The study was designed to determine whether or not infants with IVH in the perinatal period, demonstrated improved development, after participation in an intensive sensorimotor intervention program, when compared to a control group. The results described should be interpreted with some caution due to the small sample presented. More representative numbers should be available for analysis by 1988.

Description of the Sample. At the onset of this study, infant and maternal demographic and perinatal data were collected from the infant's medical record and from questionnaires completed by the mother. These data were analyzed in terms of the incidence by group; differences between control and experimental groups; and in terms of their relationship to control and experimental group subject's performance on the posttest Battelle Developmental Inventory (BDI), and the Parenting Stress Index (PSI), as appropriate.

Table 3.11 presents a summary of infant and maternal demographic and perinatal variables by group, and related _t_ test probabilities. There were no statistically significant differences between groups on any of these measures. Table 3.12 summarizes the incidence of infant demographic and perinatal characteristics by group, whereas Table 3.13 presents the incidence of maternal characteristics by group. The control group had a 2.1 ratio of subjects with mild versus severe IVH. In the experimental group there was a 2.1 ratio of subjects with severe versus mild IVH. These differences were statistically significant (p = .05). Again, with a small sample, these differences can occur. Through random assignment, these groups will probably become more equivalent as the sample increases.

In addition, the control group had almost twice as many cesarean versus vaginal births, which was in direct contrast to the experimental group which had more vaginal births. The experimental group had twice as many subjects with bronchopulmonary dysplasia (BPD) and perinatal hearing problems when compared to the control group. None of these group differences reached statistical significance.

With respect to parent socioeconomic status, the control group had a higher percentage of subjects in the unemployed (level 1) and the semi-skilled (level 2) categories, and the experimental group had a higher percentage represented in the semi-professional (level 3) and professional (level 4) categories. Neither of these group differences were statistically significant.

An analysis of covariance (ANCOVA) was performed on pretest Battelle Developmental Inventory (BDI) scores by group. Table 3.14 summarizes, for each pretest BDI score, the order in which predictor variables entered the regression equation, and the total cumulative amount of variance accounted for by these variables. ANCOVA _F_ values and associated significance for the pretest BDI Total and

Table 3.11

Means and Standard Deviations of Infant and Maternal Demographic and Perinatal Variables by Group - SLC/IVH Project

Variables	Control Group (n=14)		Experimental Group (n=10)		ttest Probability
	Mean	SD	Mean	SD	
Infant					
Birthweight (grams)	1652	814	1214	248	.12
Gestational Age (weeks)	31	4.0	30	4.0	.51
1' APGAR	5	3.0	3	3.0	.10
5' APGAR	6	2.0	5	2.0	.24
Days Assisted Ventilation	29	41	32	25	.84
Age at Pretest (months)	3.5	.6	3.7	.7	.68
Age at Posttest (months)	12.4	.9	12.0	.6	.18
Maternal					
Age (years)	25	4.0	26	6.0	.61
Parity (prior live births)	2.0	1.0	3.0	2.0	.20
Number of Abortions	.5	.65	.1	.31	.09
Number Living in Home (adults & children)	4.2	1.3	4.8	2.2	.42
PAAS	13.2	5.3	14.4	5.2	.64

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Table 3.12

Incidence of Infant Demographic and Perinatal Characteristics by Group - SLC/IVH Project

Characteristics		Control Group (n=14)		Experimental Group (n=10)	
		N	%	N	%
IVH	Mild *	10	71	3	30
	Severe *	4	29	7	70
RACE	White	14	100	10	100
	Black	--	--	--	--
SEX	Male	7	50	5	50
	Female	7	50	5	50
BIRTH	Single	10	71	8	80
	Twin	4	29	1	10
	Triplet	--	--	1	10
LOCATION	Inborn	8	57	4	40
	Outborn	6	43	6	60
DELIVERY	Vaginal	5	36	6	60
	Cesarean	9	64	4	40
SIZE	AGA	14	100	10	100
	SGA	--	--	--	--
HMD		11	79	8	80
BPD		6	43	8	80
PDA		7	50	5	50
HYPERBILIRUBINEMIA		2	14	1	10
RETINOPATHY		4	29	3	30
HEARING IMPAIRMENT		5	39	4	80
SEPSIS		--	--	2	20
SEIZURES		2	14	--	--
V-P SHUNT		1	7	2	20

* = Significant difference (p ≤ .05)

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Table 3.13

Incidence of Maternal Characteristics by Group - SLC/IVH Project

Characteristics	Control Group (n=14)		Experimental Group (n=10)	
	N	%	N	%
MARITAL STATUS				
Single	1	7	1	10
Married	13	93	9	90
SES (Duncan SEI)				
Unemployed	1	7	- -	- -
Semi-skilled	5	36	1	10
Blue collar	5	36	4	40
Semi-professional	- -	- -	2	20
Professional	3	21	3	30

Table 3.14

Pretest Stepwise Multiple Regression Predictor Variables and Cumulative Variance by Outcome Measures - SLC/IVH Project

Outcome Measures	Demographic and Perinatal Predictor Variables				
	Var.	Var.	Var.	Var.	Cum.r^2
TOTAL BDI	BIR	SES	SES	ABPR	.84
Personal-Social	BIR	SES	GA	AUD	.85
Adaptive	BIR	SES	LIH	ICU	.78
Total Motor	BIR	INT	BILI	SEP	.76
Gross Motor	BIR	MAG	SES	---	.65
Fine Motor	BIR	VENT	ABPR	ICU	.66
Communication	SEX	SEP	BILI	ICU	.74
Cognitive	BIR	SES	---	---	.77

BDI = Battelle Developmental Inventory
SES = mother's socioeconomic status
GA = gestational age
LIH = # living in the home
INT = days intermediate care
MAG = mothers age
SEX = male or female

BIR = single, twin, or triplet
ABPR = age at pretest
AUD = hearing problems
ICU = days intensive care unit
BILI = hyperbilirubinemia
VENT = days assisted ventilation
SEP = sepsis

subdomain scores by group are presented in Table 3.15. Table 3.16 summarizes the adjusted and observed pretest BDI Total and subdomain scores, observed score standard deviations (SDs), and observed score developmental quotients (DQs) for the control and experimental groups. All subject's earned average DQ scores on all tests. There were statistically significant differences between groups, in favor of the experimental subjects, on the Total Motor and Cognitive subdomains as well as on the Fine Motor component.

Infant Temperament and Parenting Stress Ratings. Table 3.17 presents the incidence of infant temperament ratings, at 6- to 9-months corrected age (prematurity corrected to 40 weeks plus 6- to 9-months) by group. There were no statistically significant differences between groups on any of these ratings. Carey, Fox, and McDevitt (1977) report that children rated as "difficult" as infants were found to be significantly more impulsive than those who earned "easy" or "intermediate" temperament ratings. With respect to school adjustment scores, children labeled "easy" in infancy had significantly poorer adjustment as compared to other groups. Children in the "intermediate" group were found to have the best school adjustment.

A summary of the control and experimental group results on the Parenting Stress Index (PSI) is presented in Table 3.18. No significant difference was found between groups on level of stress on any of the measures. The overall intensity of stress indicated on the Total, as well as on the Child and Parent subdomains, was moderate. Parents who received intervention did not experience significantly less stress than those who were in the control group.

Major Analyses of Group Differences at Posttest. Zero-order correlations were run between all infant and maternal demographic and perinatal variables; infant pretest Battelle Developmental Inventory (BDI) Total, subdomain, and Gross and Fine Motor component scores; infant posttest BDI Total, subdomain, and Gross and Fine Motor component scores; and Parenting Stress Index (PSI) scores (Nie, Hull, Jenkins,

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Table 3.15

Analysis of Covariance F Values and Associated Significance by Pretest BDI Outcome Measures - SLC/IVH Project

Outcome Measures	Source of Variance	ANCOVA	
		F	Sig
TOTAL BDI	Group	.99	.34
	IVH	.21	.65
	Interaction	4.86	.04
Personal-Social	Group	.00	.96
	IVH	.04	.85
	Interaction	.70	.42
Adaptive	Group	.54	.47
	IVH	1.31	.27
	Interaction	.03	.87
Total Motor	Group	4.38	.05
	IVH	.84	.37
	Interaction	.02	.88
Gross Motor	Group	.03	.87
	IVH	.25	.62
	Interaction	3.97	.06
Fine Motor	Group	5.38	.03
	IVH	.64	.43
	Interaction	1.78	.20
Communication	Group	2.94	.11
	IVH	3.82	.07
	Interaction	2.48	.14
Cognitive	Group	6.06	.02
	IVH	.17	.68
	Interaction	1.09	.31

Table 3.16

Pretest BDI Total and Subdomain Adjusted and Observed Mean Raw Scores, Observed Score Standard Deviations, and Observed Score Mean DQs by Group - SLC/IVH Project

Score	Control Group (n=14)				Experimental Group (n=10)			
	Adjusted	Observed	SD	DQ	Adjusted	Observed	SD	DQ
TOTAL BDI	60	58	14.0	98	63	66	11.1	108
Personal-Social	17	17	4.2	97	17	18	4.8	99
Adaptive	13	12	3.4	102	12	13	3.2	104
Total Motor *	12	12	2.9	95	14	14	3.2	98
Gross Motor	9	9	1.8	96	9	9	1.7	96
Fine Motor *	4	4	1.7	99	5	5	2.1	102
Communication	10	9	2.8	103	11	11	1.6	115
Cognitive *	7	7	2.8	104	9	9	1.6	113

* Significant difference (p < .05)

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Table 3.17

Incidence of Infant Temperament Ratings at 6 to 9 Months by Group - SLC/IVH Project

Rating	Control Group (n=14)		Experimental Group (n=10)	
	N	%	N	%
Easy	3	21	3	30
Difficult	4	29	2	20
Slow-to-Warm	1	7	--	--
Intermediate	6	43	5	50

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Table 3.18

Parenting Stress Index Total and Subdomain Mean Raw Scores, Standard Deviations, and Percentile Rank Ratings by Group - SLC/IVH Project

Score	Control Group (n=14)			Experimental Group (n=10)		
	Mean	SD	PR	Mean	SD	PR
Total PSI Score	234	45	65	225	35	55
Child Domain	105	22	65	101	20	60
Parent Domain	129	32	65	125	17	60

Steinbrenner, & Bent, 1975). Predictor variables (pretest BDI Total, subdomain, and Gross and Fine Motor component raw scores; gestational age; birth weight; sex; mothers age; type of birth; inborn/outborn status; appropriate for gestational age versus small for gestational age (AGA vs. SGA); hyaline membrane disease (HMD); bronchopulmonary dysplasia (BPD); patent ductus arteriosis (PDA); hyperbilirubinemia; retinopathy; perinatal hearing problems; sepsis; hospital; days intensive care status; days intermediate care status; days on assisted ventilation; number of persons living in the home; maternal socioeconomic status; marital status of mother; infant age at pretest; and, infant age at posttest) were entered into a stepwise multiple regression equation with posttest Battelle Developmental Inventory (BDI) and Parenting Stress Index (PSI) scores as the dependent variables. Table 3.19 summarizes, for each dependent variable, the order in which predictor variables entered the regression equation, and the associated amount of variance accounted for.

Separate analysis of covariances (ANCOVAs) were then run with the respective predictor variable(s) as covariates of posttest BDI outcome by group. Table 3.20 presents the adjusted and observed posttest BDI Total and subdomain scores, observed score standard deviations (SDs), and observed score developmental quotients (DQs) for control and experimental groups. A summary of the ANCOVA $\underline{F}$ values and associated significance by posttest BDI outcome measures is presented in Table 3.21.

There was a significant difference between groups in posttest BDI Total scores. Subjects who participated in early sensorimotor intervention, in addition to receiving routine medical follow-up, earned higher scores than those subjects who received only the routine medical follow-up. Given the small sample sizes in this study, it is noteworthy that subjects in the experimental group earned scores in the BDI Personal-Social subdomain ($p = .065$) and Fine Motor component ($p = .10$) that were close to being significantly superior to those earned by control subjects.

Table 3.19

Posttest Stepwise Multiple Regression Predictor Variables and Cumulative Variance by Outcome Measures - SLC/IVH Project

Outcome Measures	Demographic and Perinatal Predictor Variables					
	Var.	Var.	Var.	Var.	Var.	Cum.r^2
TOTAL BDI	FMRS	SEX	PDA	BILI	BIR	.91
Personal-Social	FMRS	LIH	ARS	BDP	GA	.92
Adaptive	BTRS	RET	GA	GMRS	CORS	.93
Total Motor	FMRS	SEP	PDA	ICU	RET	.85
Gross Motor	PDA	FMRS	SEP	SEX	BIR	.85
Fine Motor	FMRS	ICU	IQ	SEP	- - -	.82
Communication	SEX	SEP	BILI	- - -	- - -	.81
Cognitive	INT	SEX	FMRS	CORS	- - -	.72
TOTAL PSI	HMD	GMRS	ARS	ABPO	BIR	.80
Child Domain	HMD	ABPO	GMRS	ARS	PSRS	.77
Parent Domain	- - -					

BDI = Battelle Developmental Inventory
SEX = male or female
BIR = single, twin, or triplet
LIH = # living in the home
BPD = bronchopulmonary dysplasia
SEP = sepsis
ICU = days intensive care unit
INT = days intermediate care
HMD = hyaline membrance disease
PSI = Parenting Stress Index
RET = retinopathy

FMRS = pretest Fine Motor score
PDA = patent ductus arteriosis
BILI = hyperbilirubinemia
ARS = pretest Adaptive score
GA = gestational age
BTRS = pretest Total BDI score
GMRS = pretest Gross Motor score
IQ = inborn vs. outborn status
ABPO = age at posttest
PSRS = pretest Personal-Social score
CORS = pretest Communication score

Table 3.20

Adjusted and Observed Posttest BDI Total and Subdomain Mean Raw Scores, Observed Score Standard Deviations, and Observed Score Mean DQs by Group - SLC/IVH Project

	Control Group (n=14)				Experimental Group (n=10)			
Score	Adjusted	Observed	SD	DQ	Adjusted	Observed	SD	DQ
TOTAL BDI *	153	152	19.4	74	159	164	22.0	81
Personal-Social	40	39	8.0	85	43	46	7.3	98
Adaptive	32	31	5.1	82	32	34	3.6	86
Total Motor	41	41	6.5	69	39	40	7.9	65
Gross Motor	25	26	4.6	69	24	24	6.0	65
Fine Motor	15	16	3.0	85	16	16	3.1	85
Communication	21	21	3.8	79	23	23	4.7	82
Cognitive	21	21	1.9	91	20	20	1.8	86

* Significant difference (p < .05)

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Table 3.21

Analysis of Covariance F Values and Associated Significance by Posttest BDI Outcome Measures - SLC/IVH Project

Outcome Measures	Source of Variance	ANCOVA	
		F	Sig
TOTAL BDI	Group	4.49	.05
	IVH	6.52	.02
	Interaction	.24	.63
Personal-Social	Group	3.96	.065
	IVH	4.62	.048
	Interaction	.08	.78
Adaptive	Group	.08	.78
	IVH	.02	.89
	Interaction	3.37	.09
Total Motor	Group	.00	.99
	IVH	1.87	.19
	Interaction	.20	.66
Gross Motor	Group	.31	.59
	IVH	10.34	.01
	Interaction	.01	.93
Fine Motor	Group	3.04	.10
	IVH	1.71	.21
	Interaction	.05	.81
Communication	Group	1.76	.20
	IVH	.45	.51
	Interaction	.02	.88
Cognitive	Group	.61	.44
	IVH	.35	.56
	Interaction	1.83	.20

Subjects in the experimental and control groups earned similar observed score mean DQs on the BDI Total, subdomain, and Fine and Gross Motor component scores. BDI Personal-Social and Cognitive subdomain scores were in the average range; Total BDI, Fine Motor component, and Adaptive and Communication subdomain DQ scores were in the low average range; and BDI Total Motor subdomain and Gross Motor component scores were in the borderline range.

There was a decline in overall level of developmental functioning from pre- to posttest in both groups (see Table 3.22). This drop was greatest (a 2 standard deviation decline) in the BDI Total Motor subdomain and Gross Motor component for both groups.

Table 3.23 presents the incidence of pre- and posttest observed BDI DQ scores by group and Table 3.24 summarizes the incidence of posttest observed BDI DQ scores by severity of IVH. There was a greater range of scores on posttesting as compared to pretesting, and a larger proportion of experimental subjects demonstrated low average to average DQ scores on posttesting as compared to control subjects, who earned a greater proportion of borderline DQ scores. No subjects with Grade One IVH earned borderline DQ scores whereas no subjects with Grade Four IVH earned average or above DQ scores. No differences between proportions by group or severity of IVH were statistically significant.

Currently, infants are being followed to 7 years of age. Posttesting now occurs at 18 months corrected age and annually thereafter. Sixteen participants have received 18-month assessments, and by March 1988, 38 children will have been tested at 18 months corrected age, and this data will be analyzed. With this larger sample, a clearer picture of the effectiveness of early intervention will be available.

Those children who have been in the delayed intervention program for at least one year will begin posttesting in September 1987. Some initial analyses will be available on the 30 month posttesting by October 1988.

Table 3.22

Pre- Versus Posttest BDI Observed Score DQs by Group - SLC/IVH Project

Rating	Control Group (n=14)		Experimental Group (n=10)	
	Pre DQ	Post DQ	Pre DQ	Post DQ
TOTAL	98	74	108	81
Personal-Social	97	85	99	98
Adaptive	102	82	104	86
Total Motor	95	69	98	65
Gross Motor	96	69	96	65
Fine Motor	99	85	102	85
Communication	103	79	115	82
Cognitive	104	91	113	86

T 2,3,7,8,12,13,14/ivh
EIEI Year #1 Report
IVH folder

Table 3.23

Incidence of Pre- and Posttest BDI Observed Score Total DQs by Group - SLC/IVH Project

DQ Score	Control Group (n=14)				Experimental Group (n=10)			
	Pre		Post		Pre		Post	
	N	%	N	%	N	%	N	%
65 - 70	--	--	6	43	--	--	1	10
71 - 85	--	--	7	50	--	--	5	50
86 - 118	14	100	1	7	10	100	4	40

Table 3.24

Incidence of Posttest BDI Observed Score Total DQs by Severity of IVH - SLC/IVH Project

DQ Score	I		II		III		IV	
	N	%	N	%	N	%	N	%
65 - 70	--	--	3	38	1	14	3	75
71 - 85	4	80	4	50	3	43	1	25
86 - 118	1	20	1	12	3	43	--	--

FUTURE PLANS: The future plans for this project will include assessment of the children to the age of seven years. Enrollment will continue until 60 infants are participating in this study to assure an adequate sample for follow-up over the seven-year period allowing for attrition. During the course of this study, as the children grow older, further information will be gathered regarding neuropsychological and behavioral functioning through assessment instruments that are not appropriate for infants below 30 months. The types of measures being considered for inclusion are described following a brief introduction.

Rourke, Bakker, Fisk, and Strang (1983) suggest that many problems encountered by the infant with early brain trauma such as IVH may not be apparent until later years. Most standardized behavior assessment instruments begin past the age of 3 years. In addition to the developmental demographic parent/child interaction information currently being gathered, the child's social skills, peer interaction,and conformity to group expectations will provide valuable information. The correlation between parent involvement with the child, demographic information, cognitive performance, and behavioral concerns can be determined. This information will be valuable in terms of predicting possible behavioral problems of the infant with IVH and for planning intervention.

Examples of behavioral instruments which will be used and at what age they will be implemented is explained below.

Achenbach Child Behavior Checklist (CBCL) (Achenbach, 1981). The CBCL is appropriate for ages 4-16, therefore, it will not be used until children are 48 months of age. The CBCL is completed by the parent or primary caretaker and consists of 118 behavior problem items which have been observed within a 6-month period. Separate patterns were derived considering the age and sex of the child. For example, for males age 4 to 5, behavior problems include social withdrawal, depression, immaturity, somatic complaints, sex problems, schizophrenia, aggressiveness, delinquency, and other problems. For females age 4 to 5, behavior problems assessed are somatic complaints, depression, schizophrenia or anxiety, social withdrawal, obesity, aggressiveness, sex problems, hyperactivity, and other problems. Scoring is completed easily, and the profile clearly shows behaviors considered within normal range for the sex and age of the child.

Conners Symptom Checklist (Conners, 1970). The Conners has been standardized for children from 5-15 years of age. The Conners was developed to discriminate children who were normal, hyperkinetic, and neurotic based on parental report of symptoms. There is some criticism of the norming, validity, and reliability of the Conners, however, in a previous retrospective study conducted by EIRI of low-birthweight infants with IVH at ages 4-6, the Conners has provided valuable information regarding the incidence of hyperkinesis (now called Attentional Deficit Disorder [ADD] with hyperactivity).

Personality Inventory for Children (PIC) (Wirt, Lachar, Klinedinst, & Seat [1977]). The PIC is a 600 true-false question instrument which is completed by the parent or caregiver. The questionnaire provides information on the child and family relationships. Subscales include an Adjustment Scale (ADJ), Achievement (ACH), Development Scale (DVL), Somatic Concern Scale (SOM), Depression (D), Family Cohesion and Effectiveness (FAM), Withdrawal Scale (WDL), Psychosis Scale (PSY), and Hyperactivity Scale (HPR). The PIC has been normed for children 6 to 16 years of age, and the preschool version for children 3 to 5 years. Some research indicates that the PIC is congruent with the MMPI in predicting response to medication for hyperkinetic children. The manual indicates that the PIC could predict clinically meaningful external criteria.

Neuropsychological Assessment. Goldman, Stein, and Guerry (1983) report that, due to the rapidly developing neurological structure of the child, neuropsychological assessment considers the normal neurological development of the child. These authors suggest that it is very difficult to detect neurological deficits or delays prior to the age of 4. In addition, many tests which are commonly used in the neuropsychological assessment of children begin with a basal age of 36 months or higher.

The neuropsychological deficits or delays of the child with intraventricular hemorrhage during preschool and school years is of critical importance for planning intervention and education for these children. Neuropsychological assessment will provide information regarding not only areas of brain dysfunction, but attentional problems and learning disabilities.

As Rourke, Bakker, Fisk, and Strang (1983) point out, neuropsychological assessment usually includes information regarding development of language, motor, sensory, attentional processes, learning, and memory. However, in research one attempts to obtain as much information as possible in quantifiable and timely methods. Below are some possible instruments which could be used to provide neurological information after subjects are 42 months of age.

WABASH AND OHIO VALLEY SPECIAL EDUCATION
Project #8 (Age at Start)

COMPARISON: Mildly to Severely Handicapped Children--Early intensive, comprehensive 5-day-per-week center-based program begun before age 3 versus early nonintensive, 1-day-per-week home-based program that transitions to a later intensive, comprehensive center-based program at age 3

LOCAL CONTACT PERSON: Connie Luthe, Program Coordinator, Wabash and Ohio Valley Special Education District

EIRI COORDINATOR: Mark Innocenti

LOCATION: Norris City, Illinois (Southeastern Illinois)

DATE OF REPORT: 9-8-87

RATIONALE FOR THE STUDY: The age at which handicapped children begin to receive intervention services is considered an important aspect of a special education program. A common assumption of professionals in the field of early education for the handicapped is that the earlier intervention services are begun, the more effective the intervention program will be (White, Bush, & Casto, 1985; Garland, Swanson, Stone, & Woodruff, 1981).

Recent reviews of the literature, using meta-analysis techniques, examining the efficacy of early intervention with environmentally at-risk infants (Casto & White, 1985) and the efficacy of early intervention with handicapped children (Casto & Mastropieri, 1986), have questioned this assumption. Casto and White (1985) found only meager support for the proposition that earlier intervention is better. The review by Casto and Mastropieri (1986) found evidence contrary to the popular view. Their data suggested that handicapped children who start intervention later (at 36 months or older) do better in intervention programs.

A related issue to when to begin early intervention services is how intensive do the services need to be to make an impact (c.f., White et al., 1985). Casto and Mastropieri (1986) also examined this assumption in their review. They found that more intense programs (longer duration) are associated with intervention effectiveness for handicapped children. This finding by Casto and Mastropieri (1986) cannot be directly applied to the "age at which intervention should begin" question. Their review of treatment intensity included studies on handicapped children up through the age of 66 months. No attempt was made to separate the intensity factor by age level. Based on the Casto and Mastropieri (1986) results, the interaction of early program entry and intensity of treatment on program efficacy is not clear. In fact, studies examining program intensity with children who began intervention before 36 months of age have not found significant developmental differences based on intensity of treatment (hours per month) (Jago, Jago, & Hart, 1974; Sandow & Clarke, 1978).

This study will compare two types of intervention for handicapped children younger than 3 years of age. Children in one group will receive 5-day-per-week services at a center established to provide therapeutic services for handicapped children (early intensive). The other group of children will receive intervention services through a once-per-week visit to the home by a trained intervenor (later intensive). At 3 years of age, these children will transition into a comprehensive, 5-day-per-week center-based program. Issues related to the optimal intensity of programs and to the age of entry into programs for young handicapped children will be answered by this comparison.

All children will enter a currently established center for handicapped children, operated by the school district, upon reaching 3 years of age. Longitudinal follow-up will allow questions related to the effect of age of program entry on later functioning to be answered. The comparison will be between children who received more intense intervention before 3 years of age versus those who did not begin an intensive intervention until after 3 years of age.

In addition, the economic implication of the alternative approaches will be evaluated. A cost-benefit analysis of these approaches may provide useful information for program administrators.

PROGRAM ORGANIZATION: The Wabash & Ohio Valley Special Education District (WOVSED) is funded under a state grant that was awarded in 1985 to expand birth-to-3 services in Illinois. The district covers Harrisburg and McLeansboro counties and operates out of Norris City. The program is under the coordination of Connie Luthe. Two classroom sites have been developed, each staffed with a certified teacher and a paraprofessional aid. The classrooms are based on similar curricula and philosophies.

The home-based program has two teachers. The emphasis in this program is on meeting the needs of families. Direct intervention with the children is not strongly stressed. The home-based program is the traditional service provided in Illinois to handicapped children who are under 3 years of age. This service is typically provided by the Division of Mental Health. Under the conditions of the WOVSED state grant, these home-based services are being coordinated by WOVSED, specifically Connie Luthe.

Subjects: There are currently 54 children assigned to the two groups. Three children are scheduled to enter the study in September 1987. Of the 54 subjects, 24 are female and 30 are male. Thirty-one children have been assigned to the early intensive group (13 female, 13 male) and 23 to the later intensive group (11 female, 12 male). All the children have been labeled developmentally delayed, except for one child who has been labeled motor impaired and one who is Down syndrome. The ethnic background of all the children is Caucasian, except for one Black child. The primary language for all the children is English.

The WOVSED programs have continuous enrollment. Of the 54 subjects, 29 were enrolled for longer than 6 months. Pretest data has been obtained and analyzed for these children. Based on this initial analysis, the following description of the study population is provided. The mean age of subjects at pretest was 22 months.

The families of these children live in a rural area where 85% of the fathers and 79% of the mothers are either unemployed or work in unskilled occupations. The total yearly household income for 73% of these families is under $15,000. The majority of parents in these households have a high school degree or some high school education (75% of fathers, 77% of mothers). The majority of families of the children in this study (94%) live in a "traditional" family situation, as the parents of the children are married; although, only 73% of the children live with both their natural father and mother.

Criteria for Inclusion: Children in the programs participating in the Wabash and Ohio project qualify for participation in the research on the basis of their age and type and severity of handicapping condition. All new children must be 24 months old or younger at the time they are enrolled in the project. This cut-off point was selected to ensure that children are able to participate in the study for at least 12 months and are still enrolled in their respective programs before reaching age 3. Severity is based on the subjects' developmental quotient as established by the Battelle Developmental Inventory (BDI). The criterion for inclusion was based on standard deviation scores. Children who scored 2.0 S.D. or more below the mean on one of the major domains of the BDI, or 1.5 standard diviations below the mean on the total BDI, were eligible for the study. For each child who meets the minimum age and severity criteria, parents complete an informed consent procedure and indicate that they are willing to allow their child to be randomly assigned to one of the program options.

Procedures for Identification and Assignment: Children in each program who meet the above criteria are included as subjects in the study. The Wabash & Ohio site covers a two-county area and has two facilities for the center based program. The subjects are randomly assigned by county into either the early-intensive or later-intensive service program. During the past year, children were randomly assigned using the following system. There were four levels of severity and three age breakdowns. The ages were: (a) 0-10 months, (b) 11-20 months, and (c) 21-30 months. The levels of severity were determined by Battelle DQs and were: (a) severe 0-52, (b) moderate 53-68, (c) mild, 69-84, and (d) at-risk, 85+. The first placement in each cell was determined by a flip of the coin, and placement alternated from that point. In families where siblings were to enter the program, one sibling was randomly selected and placed into a program based on the above procedures. Other siblings were then entered into the same program. Subjects were placed in an ongoing manner via phone calls to the site liaison. The site liaison and program staff had no knowledge of the actual order of entry of subjects.

For the coming year, a different randomization system will be used. Two age and two severity levels will be established. Age levels will be: (a) 0-12 months, and (b) 13-24 months. The levels of severity will be: (a) severe and moderate (0-68), and (b) mild and at-risk (69-85+). This will allow the creation of a 2-by-2 matrix. The first child enrolled in a cell sets the randomization sequence for himself and the next three subjects. Four different randomization sequences will be determined. Based on the role of a four-sided die, the randomization sequence will be selected for placement of the initial child and the next three entries into that cell.

Subject Attrition: The children graduate into two possible placements, depending on the posttreatment data, recommendations of WOVSED staff, and parent desire. The possible placements are either an at-risk early childhood program or an early childhood special education program. The at-risk program is for children who are demonstrating delays, but the delays are not significant enough to require special education services. The early childhood special education program is for children with more severe delays. Both programs are administered by WOVSED. Ten children (three from the home-based program and seven from the center, including a set of triplets who have been consistently placed together) have "graduated" into the early childhood special education program. Six children (three home-based and three center-based) have "graduated" into the at-risk program. One home-based child has graduated into a no-service condition because he was ineligible for either program. One graduate has moved but has been followed for posttesting. Two children have been lost to the study; one has refused any service and the second moved without leaving an address.

EXPERIMENTAL INTERVENTIONS: The two groups being contrasted are children who receive either early-intensive or later-intensive services. The later-intensive group receives home-based services prior to reaching age 3. The later-intensive group serves as the control group, and receives minimal therapeutic services. The early-intensive group receives 5-day-per-week center-based training. The following descriptions provide more information on these different groups.

Early-Intensive Group Classroom: The Wabash & Ohio Valley Special Education district has recently developed a new 5-day, 2-1/2 hour-per-day center-based program for birth to 3-year-old children. The program uses a number of published curricula (e.g., the Hawaii Early Learning Profile) and emphasizes direct instruction of developmental skills. The resources for establishing this program were provided by a state 0-3 pilot program grant. Before age 3, children in the early-intensive group will be served in this center-based program. At age 3, children will transition to one of two possible 5-day-per-week public school programs.

Children are assessed in the classroom using the RIDES, which is a curriculum-referenced measure. The individual goals are established through this assessment and through the use of a sequence of objectives that have been developed by the district. The classrooms are scheduled to include social and group experiences in addition to time periods during which individual goals are worked on.

The classrooms are limited to an 8:2 children:staff ratio. Staff consists of a teacher and an aide. The teachers for this program are certified teachers. The aides serve as paraprofessional trainers in the classroom. The teachers are responsible for program development for each student based on the assessment information described above. The individual goals are set, and time is scheduled for daily programs to meet short-term objectives. The schedule of the classroom is set by the teacher. The day begins with an introductory group activity where names and early concepts are discussed. The daily sessions typically include group activities for music and language development, free play, self-help skills development, and time for work on individual goals. The children in the classroom are offered an evaluation by occupational, physical, and language therapists. These services are not available through the WOVSED. Parents may contract privately for these services, but the typical child does not receive them.

Transportation to and from the two centers is provided by WOVSED. The parents occasionally bring their children to school and observe the class. The teachers keep parents informed of their children's progress through phone contacts and individual notes sent home. Teachers do provide programs for the parents to complete at home.

The classroom program is in operation for 9-1/2 months, with a break from June 15 to August 15. The intent of the program is to provide intensive daily intervention in order to promote optimal developmental progress.

Later-Intensive Group: Children receive once-per-week home visits made by staff hired under the supervision of the WOVSED coordinator. The two home teachers have bachelor's degrees but are not certified teachers. The services are provided according to a mental health model and basically focus on educating the parents and helping them to access services such as medical care, etc. The home visits are approximately 1 hour in duration. The home teacher brings interesting and varied materials, a notebook on each child with complete assessment information, goal sheets, and system for data management. The home teacher directs brief developmental activities with the child; for example, reading books, doing a puzzle, shape sorting, etc. The teacher describes to the parent what she is doing and encourages the parent to be involved and to attempt similar activities with the child. A portion of the home visit is designed to address the needs and concerns of the parents. Home teachers engage in counseling-type activities. During this section of the visit, medical or emotional problems may be discussed, as well as issues of general support. The home teacher helps parents to access additional services for their family. The home teacher also discusses normal child development with the parents and what are reasonable expectations for their delayed child. The home program does not break for the summer. Service is continuous throughout the year. The attendance data indicates that service generally (over 80%) takes place once per week.

TREATMENT VERIFICATION: A number of procedures have been implemented in order to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data. Child's participation in the program is recorded according to which program they are in. Staff in the centers keep attendance, and has averaged above 80%. Home-based staff keep data on each session and attempt to reschedule make-up sessions for each one missed.

2. Parent report of time. Parents in both groups complete postcards on a weekly basis which indicate (a) how much time they spent with a staff member of the program, and (b) how much time was spent working with the child on activities suggested by the program. Data indicates a total of 65.7% of parents returned some postcards.

3. Staff evaluations. Staff evaluations were completed by the WOVSED coordinator. Areas assessed included general skills and competence, problem solving, work habits, staff relations, communication, and attitude. In addition, classroom teachers were evaluated on assessment skills, IEP development, IEP implementation, presentation of instruction, and instructional environment. No problem areas were found with staff skills. Classroom teachers and aides scored higher in terms of overall skills.

4. Parent involvement. A description of parent involvement was also completed by staff. The attempt was made to evaluate the quality of parent involvement based on parents' attendance, their knowledge, and how supportive the parents were (for example, their follow-through at home, form completion, willingness to communicate, etc.). The parents were rated on a scale of 1 to 3 to each area described above. The data analysis indicates that the parents in each group provide quality involvement.

SITE REVIEW: Both the McCleansboro and Harrisburg Centers were found to utilize similar assessment instruments, curricula (McComb, Portage, a WOVSED program of objectives, and the RIDES criterion referenced test), and IEP procedures. IEPs were in place for all children with the exception of several new enrollees. Teachers at both centers were observed to use appropriate reinforcement and language. the Harrisburg site has initiated a parent involvement program.

As a result of the center-based on-site visits, this project will be encouraged to develop more individualized lesson plans, records of child progress data, and to expand the parent involvement activities at the McCleansboro site. Classroom recommendations include focusing on development of child independence skills.

The home program, which was also observed, was a well-organized and positive experience for the parent and child receiving the home visit services. The home teacher worked directly with the child and established excellent rapport with both the mothers and child. She did not work with the mother in terms of direct instruction or ask the mother to participate in activities. The intent is that the parent learns from modeling. The home teacher conducted six different activities with the child working on language, color, and fine motor skills. Lesson plans were well prepared; a notebook for each child contained pertinent assessment information, objectives, and data collection forms. The folder samples from the home program were well organized. All folders contained IHPs and a Family Service Plan. The goals and objectives appeared appropriate; however, some were lacking evaluation criteria.

The folder samples from the home program were well organized. All folders contained IHPs and a Family Service Plan. The goals and objectives appeared appropriate; however, some were lacking evaluation criteria.

DATA COLLECTION: The following section describes data collection procedures and management of on-site testers.

Pretest: Parents of each child participating in the study have completed an informed consent form and provided demographic information. Children have been administered the Battelle Developmental Inventory (BDI), and parents completed the Parenting Stress Index, Family Support Scale, Family Resource Scale, Family Inventory of Life Events and Changes (FILE), and the Family Adaptability and Cohesion Evaluation Scales (FACES) as pretest measures. These measures may be used as covariates in the analysis as well as providing information whether certain types of families or certain types of children profit more from intervention than others.

The BDI is administered by a trained diagnostician who is unaware of the child's group assignment. Testing occurs at a center which is centrally located to the programs but is not the center that the family attends. This ensures that the testing setting is equally unfamiliar to all subjects. Mothers complete the family measures following the administration of the BDI. Married mothers and those with spouse equivalents are also given a copy of the Family Support Scale to take home for their husbands to complete. Parents are offered an incentive of $20 for filling out all the family measures and demographics. The diagnostician completes a testing report and then transmits all data to the EIRI site coordinator.

Posttest: Posttest measures are collected in the spring of each year, provided the child has been in the program for a minimum of 6 months. Posttest measures consist of the Battelle Developmental Inventory and the various parent questionnaires mentioned above. In addition, a parent satisfaction with treatment questionnaire and parent report of child's health will be administered at posttest. A project-specific posttest instrument, which will assess the differential effects on developmental functioning of early-intensive versus later-intensive services, will be the Minnesota Child Development Inventory. This test was selected because it is completed by the parent and, where the later-intensive group services are provided at home, will provide a parent perspective on child progress. The Peabody Picture Vocabulary Test will also be administered to subjects' mothers as a posttest measure. This test correlates highly with standard IQ measures and it will allow the investigation of how maternal ability relates to the effects of early intervention on children.

Assessment Management: AT WOVSED, the onsite coordinator manages the assessment. She has been trained and certified by EIRI and has a local diagnostician who assists in test administration. The tester had previous experience with the BDI, having tested over 100 children with the instrument. He was trained at Southern Illinois University at Carbondale and certified by the onsite assessment coordinator. Both the coordinator and diagnostician have master's degrees in related areas. The coordinator schedules the testing and shadow scores 10% of the administrations.

DATA ANALYSIS: There are currently 54 children assigned to groups. Pretesting is ongoing as subjects are identified: posttesting occurs in the spring, provided the child has been in the program for 8 months. Twenty-nine children have been posttested at the present time. Of these 29 children, data on 27 subjects and their families have been received and processed through the EIRI coding procedures. Data on all measures were not available for all subjects at the time this analysis was completed. Activities to obtain measures missing from this analysis have been ongoing, and a complete set of data on the pretest measures will be available in the near future. The following is a summary of the pretest data available from the Wabash, Ohio site.

Analysis of Available Pretest Data: Ten males and three females were assigned to the control group, and 14 children who are in the enhanced group are divided equally by sex. A T-test was conducted to determine if age of program entry differed between the groups, and no difference was found. A series of Chi-square analyses were conducted on family demographic variables between the two groups. These variables consisted of such parental factors as: age (T-test), ethnic background, marital status, educational status, occupation, family income, and if they are currently in school. Other variables investigating number of siblings in the home, other handicapped siblings at home, and if the child receives other services or day care services are included. No differences were found between the groups on demographic variables except on the variable related to the degree that the mother holds (Chi-square = 6.9, $p = 0.03$, df = 2).

In the control group, 83.3% of the mothers have a high school diploma where only 30% of the mothers in the enhanced group have a high school diploma. In the enhanced group, 50% of the mothers have no degree. Although education of parents may be an important variable, the present bias is toward the control group. Also, even though a significant difference in terms of academic degree exists, the actual differences in terms of grades completed is not large (see Table 3.25). No difference was found in grades completed by the mothers in the two groups. Data on the mothers' age and grades completed, for both groups, are presented in Table 3.25.

Parents of children in this study are asked to complete measures of family functioning. These measures include: the Parenting Stress Index, the Family Support Scale, the Family Resource Scale, the Family Adaptability and Cohesion Evaluation Scale (FACES III), and the Family Inventory of Life Events and Changes (FILE). To determine if family functioning, as measured by these instruments, differed between the parents of the children in the two groups, T-tests were conducted on the various scales and scores obtained from these instruments. Statistically significant differences existed on only two measures: (a) the raw score of the FACES III from the section that asks questions regarding how you would like your family to be (ideal score) ($t = 2.35$, $p = 0.04$), and (b) the total score from the FILE that examines life events that occurred over the past 12 months ($t = 2.18$, $p = 0.05$).

These results suggest that the mothers of children in the enhanced group have greater expectations for what they see as their ideal family (based on the FACES III) and would have higher stress levels as a result of life events occurring in the past 12 months (based on the FILE) when compared to mothers of children in the control

Table 3.25

Demographic and Family Measures Data

Variable	Later-Intensive (Control Group)			Early-Intensive (Enhanced Group)				
	mean	(SD)	n*	mean	(SD)	n	t	p
Mother's Age (Years)	31.4	(5.9)	12	28.82	(3.9)	12	1.54	0.14
Mother's Education	11.58	(1.31)	12	11.40	(1.71)	10	0.28	0.78
Parenting Stress Index Total Score (Mother)	133.57	(10.49)	7	153.88	(41.94)	8	-1.24	0.24
Family Support Scale Total Score (Mother)	18.14	(7.95)	7	20.31	(10.90)	13	-0.46	0.65
Family Resource Scale Total Score (Mother)	106.43	(12.01)	7	112.08	(16.55)	13	-0.79	0.44
FACES III Discrepancy	10.50	(8.09)	8	12.43	(2.70)	7	-0.60	0.56
FACES III Cohesion	35.75	(6.52)	8	40.71	(2.98)	7	-1.85	0.09
FACES III Adaptability	22.75	(4.71)	8	24.14	(2.27)	7	-0.71	0.49
FILE Total Score Past 12 Months (Mother)	10.13	(3.18)	8	14.43	(4.43)	7	-2.18	0.05

*Based on available coded data. Data entry is not completed and some data are not yet available on all subjects.

Note: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and adaptability scores indicate greater amounts of these factors.

group. Although these mothers have greater ideals for their family, the failure to find statistically significant differences between the groups on the FACES scales that measure how mothers currently view their family (perceived score), or on the discrepancy measure that looks at the difference between the perceived and ideal scores, suggests that mothers of children in the enhanced group generally have a more positive view of their family. This appears to be true (see Table 3.25) in that mothers of children in the enhanced group have higher mean scores on the FACES, with less variance than mothers in the control group. These differences are not significant but they consistently occur. These family differences, like the mothers' degree levels, bias the study toward the control group. Data on some of the family measures are presented in Table 3.25.

The Battelle Developmental Inventory (BDI) is used as the primary instrument to measure changes in the child's skills. Subject pretest scores on this measure would be expected to have a direct effect on posttest scores. Therefore, the performance of children in the two groups should be similar at pretest to help insure differences that occur later are the result of the treatment. T-tests were conducted between the two groups on the raw scores, age equivalences, and developmental quotients scores obtained from the total score of the BDI and from each of the domains and subdomains assessed by this test. No significant differences were found on any of these measures. Data on these measures are presented in Table 3.26.

Pretest Summary: Currently available pretest measures from the Wabash/Ohio site were examined to determine if the random assignment procedures had been successful in establishing two equal groups that will differ only in terms of treatment. In terms of child age, handicap, and skill variables, the groups appear homogenous. In terms of demographics and family functioning, the groups are homogenous except for three variables. The data indicate the mothers of children in the enhanced group are different from the mothers of children in the control group, in that they less often

Table 3.26

BDI Raw Scores

Variable	Later-Intensive (Control Group) mean	(SD)	n*	Early-Intensive (Enhanced Group) mean	(SD)	n	t	p
Personal Social	63.08	(22.89)	13	57.07	(22.34)	14	0.69	0.50
Adaptive Behavior	48.15	(13.52)	13	41.07	(14.95)	14	1.29	0.21
Gross Motor	48.54	(7.25)	13	45.86	(10.30)	14	0.78	0.45
Fine Motor	25.31	(4.66)	13	23.71	(7.50)	14	0.66	0.52
Motor Total	74.00	(10.87)	13	69.57	(17.37)	14	0.79	0.44
Receptive Communication	14.00	(3.76)	13	12.29	(3.12)	14	1.29	0.21
Expressive Communication	17.23	(7.10)	13	13.86	(6.53)	14	1.29	0.21
Communication Total	31.23	(10.35)	13	26.14	(8.61)	14	1.39	0.18
Cognitive	24.92	(5.31)	13	22.79	(6.09)	14	0.97	0.34
Battelle Total Score	240.92	(56.21)	13	216.64	(64.28)	14	1.04	0.31

*Based on available coded data.

have a high school degree, they have higher expectations for their family, and they have experienced more stressful life events in the 12 months preceding their entrance into the study. These differences all bias the study toward the control groups. These differences, and all the above tests, will be reexamined upon obtaining the completed pretest data on all subjects.

FUTURE PLANS: New children will continue to be enrolled until a minimum of 60 subjects is attained. Funding for the state grant received by WOVSED has been continued for the coming year with a 5% funding reduction. This will allow the WOVSED programs to continue unchanged. A strong potential for additional monies to support the services after that time exists. Cost data will continue to be collected and analyzed while the treatment is being implemented.

Mark Innocenti has recently (August 1987) taken over the role of site coordinator from Kathryn Haring. Activities toward determining follow-up measures to be used with the site are currently ongoing. Also, additional measures useful to a longitudinal follow-up are being reviewed.

CHARLESTON, SOUTH CAROLINA IVH PROJECT
Project #9 (Age at Start)

COMPARISON: Grades I, II, III, and IV Intraventricular Hemorrhage Infants (IVH)--Services begun at 3 months adjusted age versus services at 12 months

LOCAL CONTACT PERSON: Conway Saylor, Judith Pope, Abner Levkoff

EIRI COORDINATOR: Lee Huntington

LOCATION: Charleston, South Carolina

DATE OF REPORT: 9-8-87

RATIONALE FOR THE STUDY: There are approximately 14,000 low-birthweight infants born in the United States each year. Of these 14,000 infants, 5,600 suffer periventricular-intraventricular hemorrhage. Simply described, a periventricular-intraventricular hemorrhage is the development of a lesion in the infant's brain which produces abnormal bleeding from cranial capillaries which may extend into the ventricular system. The bleeding is believed to result in different degrees of neurological damage based on the severity of the hemorrhage (Volpe, 1981).

Brain-imaging procedures such as real-time ultrasonography and computed tomography (CT) scan are used to make a positive identification of IVH and to classify the hemorrhage into one of four states of severity. Stage I IVH is the most mild form of hemorrhage, whereas Stage IV IVH is the most severe (Papile, Burstein, Burstein, & Koffler, 1978). Stage I IVH occurs in the subependyma at either the germinal matrix or the choroid plexus. Stage II hemorrhage is a subependymal hemorrhage with extension into the ventricles, but with normal ventricular size. Stage III IVH is a subependymal hemorrhage, with extension to the ventricles, which is accompanied by moderate to severe ventricular dilatation. Stage IV, the most severe form of IVH, is a subependymal hemorrhage with ventricular extension, with or without dilation, plus a parenchymal lesion. Dramatic clinical symptoms such as seizures, loss of muscle tonus, cessation of breathing, and unreactive pupils, may mark the onset of IVH; however, at times IVH is clinically silent (Tarby & Volpe, 1982).

Intervention programs for low-birthweight infants (see Bennett, 1987; Casto et al., 1987; Cornell & Gottfried, 1976; Klaus & Kennell, 1982; Masi, 1979; Ramey, Bryant, Sparling, & Wasik, 1984; for reviews) have focused on in-hospital stimulation or parent training as opposed to a comprehensive intervention, and virtually all have excluded children who have suffered major neurological insults such as IVH. At issue is the age at which intervention should start for infants who have serious medical problems and who routinely spend up to three months in intensive care units. Since these infants currently receive only medical follow-up, this study provides a good opportunity to test the age-at-start hypothesis. EIRI staff have worked closely with this program in the past, and thus anticipate an excellent working relationship for this longitudinal study. It provides a rare opportunity for a high degree of replication of another study, but with sufficient variation in the intervention to illuminate some of the parameters regarding the age at which intervention should begin and also the optimal level of intervention program for which theory provides no clear guide. From a systems theory perspective, it will be important to document how education, social service, and medical systems interact with each other and how each in turn affects the family system (Ramey, MacPhee, & Yeates, 1985).

PROGRAM ORGANIZATION: Prior to this research project, all infants who were in Neonatal Intensive Care Units were referred to the South Carolina State Department of Health Neonatal Follow-up Clinic and received routine medical follow-up from private physicians or clinics. Previous funding for these services was provided by the South Carolina Department of Health, for those utilizing the follow-up service, or by patient self-pay for those using private physicians or clinics. These services remain the standard level of care for all infants in the treatment area. Control group subjects typically receive no other services during the first phase of the study, as very few services are available. However, parents may access services in the community if they desire. Parents are queried about services they have accessed during the time period of the study.

The intervention program consists of a package of services delivered by project staff, including a licensed physical therapist, a child development specialist, and a trained developmental examiner. The services provided by these professionals are coordinated by the site coordinator. These providers will offer motor intervention services until infants are 12 months of age (corrected for prematurity) and home intervention services for all infants after 12 months, through 1990.

SUBJECTS: There are currently 36 children between 3 and 27 months of age enrolled in the study. Subject recruitment will continue through January 1988, at which time it is expected that 50 subjects will be enrolled. The current sample is composed of Black and White infants from both urban and rural areas.

Demographic information on the participating families has been gathered by questionnaires and from medical discharge summaries. All of the children are from families who reside in the metropolitan area of Charleston, South Carolina. The ethnic background of the sample is approximately 60% Black and 40% Caucasian. All of the participants live in homes where English is the primary language, and there are equal percentages of single parent and two parent families. The enrolled families are primarily low-income.

Criteria for Inclusion: Infants qualify for participation in the research if they have been a patient in the NICU at Charleston Medical University, if they have experienced perinatal intraventricular hemorrhage (IVH) and if they reside in the catchment area for treatment (60 mile radius). Severity of IVH is divided into mild (grades I and II IVH) and severe (grades III and IV IVH) categories. Birthweights are categorized as less than or equal to 1000 gr and greater than 1000 gr.

Procedures for Identification and Assignment to Groups: Subjects who meet the inclusion criteria are identified while in the NICU. Parents of eligible infants are contacted in the NICU and subsequent telephone contact is made shortly after discharge. For each infant who meets the study criteria, parents must indicate willingness to participate in either the experimental or the control conditions depending upon where random assignment places them. Infants are randomly assigned to treatment or control conditions by a roll of a four-sided die after stratification by severity of IVH (mild or severe) and birthweight (under 1000 gr or over 1000 gr). Parents are informed of their infant's assignment after they give approval to participate in the study.

The only people at the site who know the actual order of eligibility and enrollment of subjects are the site coordinators. The dates on which infants were born are the basis for sequence of enrollment, and infants are assigned to experimental conditions in order of eligibility.

Subject Attrition: Currently, this project has had a low attrition. The rate of attrition is being monitored and assessment will be made regarding differential drop-out rates in the experimental conditions. Also assessed with be socioeconomic factors and family variables for those who leave the study. In addition, families are contacted fairly frequently for intervention and assessment, so current records are maintained regarding the family's current address and telephone number.

EXPERIMENTAL INTERVENTIONS: Intervention occurs in two phases: an early intervention phase and a delayed intervention phase. In Phase I, the early intervention consists of a sensorimotor intervention beginning when the infant is 3 months of age. The delayed intervention group receive only routine medical services described previously during Phase I. In Phase II, the delayed intervention phase, all infants receive home intervention services and sensorimotor services as needed, and parents and infants participate in monthly center-based groups.

Early Intervention Service: The current level of service to experimental subjects between 3 and 12 months corrected age is a bi-monthly one-hour session with the physical therapist. The therapist works with the infant utilizing the Curriculum and Monitoring System (CAMS) motor intervention materials.

The Curriculum and Monitoring System Motor Intervention Program (CAMS) (Casto, 1979) was designed to meet the developmental needs of young handicapped children in gross and fine motor areas. With training, the motor program can be used by parents, teachers and paraprofessionals in the home or in an institutional/ school setting. Curriculum books are provided with developmentally sequenced programs for assisting in a child's gross and fine motor development. A placement test is administered in the motor skills domain to determine which objectives should be offered to the child. The objectives of the program are developmentally sequenced beginning at birth and extending to 5 years of age.

A typical intervention session would include the therapist working with the child, with the parent present. The physical therapist also instructs the parent on exercises that child can do at home, and the parent practices and demonstrates competence on the exercises before the parent begins home intervention. The parents work with the child at home for at least 20 minutes per day, 5 days per week, on techniques they have learned in the intervention sessions. The physical therapist telephones the parent on weeks they do not meet to answer questions and provide guidance on implementation of intervention techniques. Attendance and progress are monitored on an ongoing basis by the physical therapist's progress notes and the motor program placement test checklist is updated as goals are met.

Parents record the time spent with the child initiating the motor intervention. According to preliminary data, 90% of the parents in the early intervention program are completing the assigned time requirements, and providing accurate records of their intervention sessions. For those few parents who are not following the intervention criteria, the physical therapist has maintained careful records of telephone calls and appointments attempted to get program compliance.

Delayed Intervention: At 12 months corrected age, all subjects enrolled in the study begin expanded intervention programs utilizing the curriculum and monitoring system (CAMS) programs. All subjects are given placement tests in motor, social-emotional, self-help, receptive language, and expressive language domains and then participate in an expanded intervention program, which includes weekly contacts alternating home visits and center-based group sessions for parent-infant dyads.

Each of the CAMS curriculum programs is printed in an easy-to-use block style design and bound in a notebook. This format was selected to allow persons administering the program to photocopy individual pages for use by the parents or trainers working directly with the children. The five CAMS Programs are: (a) receptive langauge, (b) expressive language, (c) motor development, (d) self-help skills, and (e) social-emotional development.

The **Receptive Language Program** teaches the student skills that do not require him to talk but are necessary in the understanding of oral language. Skills include identifying objects, following commands, and touching body parts.

The **Expressive Language Program** teaches children general speaking skills, beginning with the formation of sounds and proceeding through the development of simple grammatical sentences. It focuses on language-building articulation.

The **Motor Program** is designed to teach gross and fine motor skills to children who have delayed motor skills. The program stimulates normal motor development patterns, beginning with raising the head and proceeding through running, hopping, and drawing squares and diagonals. This program is intended for children with mild to moderate impairments.

The **Self-Help Program** is designed to teach basic social-emotional skills to both normal and developmentally delayed children. The developmentally sequenced program begins with teaching a child to respond to a person and proceeds through teaching him to handle frustration and exhibit self-control.

The **Social-Emotional Program** is designed to teach basic social-emotional skills to both normal and developmentally delayed children. The program which is sequenced developmentally, begins with teaching a child to respond to a person and proceeds through teaching him to handle frustration and exhibit self-control.

A child development specialist administers the CAMS placement tests, determines developmental levels, and sets appropriate goals for intervention in each domain in conjunction with an IEP team which include the child's parents.

The child development specialist meets with the parent and child for one-hour twice each month and provides intervention. For each session, an objective is determined for the child and the child development specialist models the training for the parent and has the parent demonstrate. The parent is asked to spend 20 minutes each day, 5 days each week providing similar intervention with their child at home. The parent keeps a log of the time spent training the child during the week. The child development specialist calls the parent via telephone weekly between clinic appointments to check on progress and answer questions. When the child returns for the next session, the child development specialist has the parent elicit the new behavior from the child. If the child demonstrates competence in that area, a new objective is chosen and modeled for the parent.

For example, the objective for a child may be to point out facial features. The specialist will teach the parent an exercise to teach the child facial features. When the next meeting occurs, the specialist has the child point out facial features. If the child shows competence in that area, a new objective is established. Some children have objectives in several domains, others may have only one area of delay. The specialist also provides recommendations to parents regarding problems or concerns such as toileting or behavior problems of the child.

On alternating weeks to the home intervention sessions, the parent and child attend a group session (bimonthly). The group sessions combine hands-on intervention activities utilizing the CAMS curricula, together with a guest speaker who focuses on some intervention topic.

If a child in the delayed intervention group is identified by the placement test as having a motor delay, s/he will be referred to the physical therapist for motor intervention. Those children in the early intervention group who still require motor services will continue meeting with the physical therapist. If a child who has received motor services in the early intervention group no longer requires those services, s/he will terminate services with the physical therapist and receive home intervention only. The physical therapist follows the same procedures outlined in the early intervention service section.

TREATMENT VERIFICATION: A number of procedures have been implemented to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data. Both home visits and clinic visits are recorded. Phone contacts also are noted in the subject's chart by the physical therapist.
2. Parent report of time. Parents complete a daily log of time spent working at home with their infant on activities suggested by the program. Theses records are collected by the intervenor and sent to the site coordinator for recording on a monthly basis.
3. Site review. A formal site review will be conducted annually. The Charleston site review will be conducted on September 8 and 9, 1987.

SITE REVIEW: A site review is scheduled for September, 1987. The purpose of this review will be to collect information regarding the nature and quality of the early intervention services delivered at this site. Documentation of treatment implementation will occur to ascertain if the intervention services are being provided as intended and that the project is remaining faithful to the research protocol.

The site review will be conducted according to procedures described in the Guide for Site Reviews of EIRI Research Sites, in the Treatment Verification Handbook for

Research Sites (EIRI, 1987).

DATA COLLECTION: Data is being collected for this study to determine the effects of intervention upon the child and the family. The assessment instruments have been chosen to provide some consistency of data collection across sites, but also provide information about children who experience intraventricular hemorrhage at birth and the unique experiences of their families.

Pretest: At 3 months corrected age (prematurity corrected to 40 weeks plus 3 months) all infants are tested with the Battelle Developmental Inventory (BDI), and the parents complete the Parenting Stress Index (PSI), the Family Support Scale, (FSS), the Family Resource Scale (FRS), the Family Inventory of Life Events and Changes (FILE), and the Family Adaptability and Cohesion Evaluation Scales (FACES III). The BDI is administered by a trained diagnostician who is unaware of the infant's group assignment. All test and questionnaire protocols are sent to the program coordinator for scoring and placement in a data file. A duplicate set of the data is sent to EIRI. Parents are paid $20 for their time in completing the evaluation session. This battery of tests provides information regarding both the infant's developmental level and early family reaction to the new born.

Interim Testing: When infants are 6 months corrected age, their parents are mailed the Carey Infant Temperament Scale to complete. This questionnaire is returned directly to the site coordinator via postpaid mail.

The Carey Infant Temperament Scale assesses the parents' estimate of the infant's temperament. Scoring categorizes the infant into easy, intermediate, slow-to-warm, and difficult categories. This information will be compared with the ratings of the videotaped parent/child interaction to determine if the child's temperament affects interactions with the parent.

Posttest: Posttesting occurs at 12 months corrected age and annually thereafter. The posttest battery is administered by the same diagnostician who is "blind" to the subject's group assignment. The child is given the BDI and the parent completes the PSI, FILE, FACES III, FSS, FRS, a survey of additional services received by the child in the last year, a report of child health during the last year, and a parent socioeconomic survey. Parents are paid $20 for completion of the evaluation. An additional measure taken at 12 months corrected age is the Minnesota Child Development Inventory (MCDI). Also, at 12 months corrected age, videotapes of mother-infant interaction and of infant motor development are completed by a trained child development specialist or a licensed physical therapist. Parents are paid a $10 incentive for videotaping.

The videotape of motor functioning follows a specific script. The motor script has the child perform the following behaviors (based upon the child's level of motor development): reaching and grasping from a supine position, rolling over and reaching and grasping from a prone position, creeping and crawling, sitting and reaching, pulling self up to stand, walking, and squatting to pick up a toy.

The parent-child interaction videotape involves the parent and child in play activities. In the first section, the mother and child play together for 15 minutes "as they would at home." Then for one minute the parent encourages the child to put the toys away. For the next two minutes, the parent reads to the child. Then the parent leaves the room for 45 seconds, and taping continues for two minutes after the parent returns to the room.

The posttest data provides information regarding the child's developmental change in the first 12 months (and yearly thereafter), and the effect of intervention services upon the child's development. Change in the family during this time, including socioeconomic change are being determined. Also, infant temperament and development are being compared with the quality of parent/child interaction on the videotape ratings.

Assessment Management: One local diagnostician has been trained to administer the pretest and posttest measures. The diagnostician has a master's degree. Testing is scheduled directly with the diagnostician by the site coordinator. The diagnostician has no contact with the intervention staff, and, therefore, is "blind" to the group assignment of the children. Shadow scoring of 10% of test administrations is conducted by another trained diagnostician, and interrater reliability has been above .90 for this diagnostician.

DATA ANALYSIS: As data is collected, it is being coded and checked for errors before being placed on data cards. The cards are checked for accuracy before being analyzed. Data is now being prepared for pretest analysis, which should be completed by October 1987.

The pretest analysis will provide information regarding initial group differences on infant development measures, family demographics, or family variables. If there are pre-existing differences between groups, these variables will be used as covariates in the posttest analysis to determine the effect of early intervention services. Future analyses will also examine parent involvement in intervention and outcome.

FUTURE PLANS: Services will continue for children enrolled in this study through 1990. As children grow older, additional assessment instruments, which are normed for preschool children and above may be added. Tests will include both behavioral measurements and neuropsychological instruments. Cost-benefit analyses will also be conducted, and this information will be made available in the future.

INDIANA SCHOOL FOR THE DEAF
Project #10 (Age at Start)

COMPARISON: Hearing Impaired Children--Intervention services begun between 6-18 months of age versus at 24 months of age

LOCAL CONTACT PERSON: Lee Murphy, Superintendent

EIRI COORDINATOR: Bob Rittenhouse

LOCATION: Indianapolis, Indiana

DATE OF REPORT: 9-9-87

RATIONALE FOR THE STUDY: Language learning does not occur as spontaneously for deaf children as it does for hearing children. While the learning of language by deaf children is complex in and of itself and only a small percentage ever gain control over it, they also are at a disadvantage in gaining knowledge about the world, internalizing and organizing experiences and placing those experiences in appropriate contexts. For them, specialized instruction and intervention is often necessary. The field of deaf education has developed a number of intervention approaches to address the needs of deaf children including alternative communication, auditory training techniques, and learning experiences to provide them with experiences as similar to those of hearing children as possible. These experiences are provided in a more deliberate fashion, are carefully planned and monitored, and accordingly revised. As the field of deaf education has evolved, several assumptions have been made about how to address the needs of young deaf children. One of those assumptions is that the earlier a carefully planned, focused and deliberate intervention begins, the more progress hearing impaired children will make toward overcoming their disability and gaining control over language as well as developing cognitive and social skills. What little research does exist regarding the effects of early intervention with hearing impaired children has focused primarily on curriculum comparisons or family dynamics and has employed pre- and posttest designs

(Craig, 1964; Greenstein, 1975; Horton, 1976; Prinz & Nelson, 1984; Utah School for the Deaf, 1972). Cost data are essentially unavailable. Well-designed research studies examining early versus later ages at which intervention begins most efficaciously for hearing impaired children are fraught with severe design and methodological limitations. Studies employing randomized designs do not exist. Furthermore, service providers of the Indiana School for the Deaf, do not believe that beginning intensified services at 2-1/2 years of age (which is commonly when center-based begin in Indiana) is soon enough. This is a commonly held belief in the field of deaf education. One of the reasons that services are often not available before 2-1/2 years of age is because there has not been an empirically established rationale for such programs. In a competitive economy, Indiana and other states have difficulty gathering funds for nonmandated programs unless strong, data-based rationales can be made. Thus, in order to better meet the needs of young hearing impaired children, the field of deaf education must address the critical question, "Is earlier better?"

Since the current level of services at the Indiana School for the Deaf begin when a child is 2-1/2 years of age and infrequently before, and because services for babies and toddlers can be offered only with the support of this study, Indiana provides an excellent opportunity for assessing the effects and the costs of different ages-at-start of early intervention services.

PROGRAM ORGANIZATION: The Indiana School for the Deaf currently serves children throughout the state of Indiana, although the children and families participating in this study will be selected primarily from the immediate Indianapolis area. The mission of the Indiana School for the Deaf is to prepare hearing impaired children and their families for traditional specialized public school programs through speech and auditory training, communication development and psycho-social adjustment.

The Indiana School for the Deaf is funded directly by the state and serves as the administrative center for audiological and developmental assessments of hearing-impaired children. Eight counties surrounding and including Indianapolis (Marion, Hendricks, Boon, Hancock, Shelby, Johnson, Morgan, and Madison Counties) will participate in the study.

Current preschool activities center on language, cognitive and social skill development and are offered in a half-day program, attended 3-5 days per week by children 2-1/2 to 5 years of age. Limited home intervention services are currently provided to younger children. These services will be made available to identified babies and expanded to the toddlers in the eight-county area.

Because the Indiana School for the Deaf will be offering the home intervention services, comparability across the counties should be reached. Nevertheless, the services will be closely monitored by means of treatment verification procedures which will be outlined in a subsequent section of this site description.

The research locations are coordinated by specialists who work directly with the project coordinator at the Indiana School for the Deaf. All communication between them and EIRI will be channeled through the project coordinator at the Indiana School for the Deaf. She will have oversight responsibility for the research with respect to all agreements made between EIRI and the school concerning the nature of the treatment, assignment of subjects, testing and all other research procedures.

SUBJECTS: Five children have been enrolled in the study. Their ages at the time of enrollment were between 9 and 15 months (mean = 12 months, 2 weeks). The average unaided hearing loss is 84 dB in the better ear which represent a range of 65 dB to 95 dB. Descriptive data for currently enrolled subjects are described in Table 3.27 according to the stratification variables.

A total of 40 subjects are expected to be identified for inclusion in the study. Of these 40, it is expected that 20 will be in the 6 to 18 months age range while 20 will be in the 18 to 30 months age range. It is expected that the hearing loss

Table 3.27

Descriptive data according to stratification variables for currently enrolled subjects

	6-12 months	12 - 18 months
50 - 70 dB	n - 1	
70 > dB	n - 1	n - -3

distribution in these age ranges will be similar, with approximately half with a loss greater then 70 dB in the better ear and half with a loss less than 70 dB in the better ear, but greater than 50 dB; all in the speech range. Of the expected 20 subjects in the younger age range, it is expected there may be more children closer to 6 months of age than children approaching 18 months of age because the identification procedures are aimed at early identification. Overall, it is expected that the 40 subjects will be somewhat skewed toward the lower strata of the socioeconomic continuum and that there will be a minority representation of at least 25%.

Criteria for Inclusion: Children qualify for participation in the project on the basis of their hearing and their age. Toddlers who meet the minimum age and hearing loss requirements are included as potential participants. Those with low 1- and 5-minute Apgar scores (less than 4) and/or low birth weights (less than 1500 gr) are considered at risk for hearing impairment. Their parents are contacted by mail and by phone and audiologicals are arranged. Babies and toddlers with pure-tone hearing losses of 50 dB or greater in the better ear in the speech range and no older than 18 months of age are eligible for participation. The hearing loss cutoff was established inorder to include only those whose hearing losses were significant.

Unaided scores (i.e. scores taken when the child is not wearing a hearing aid), are used for identification and assignment purposes using a pure tone audiometry assessment which is conducted by a licensed audiologist (certified by the American Speech and Hearing Association). Unaided scores, rather than aided scores are used because a number of potential subjects are not yet fitted with hearing aides.

Procedures for Identification and Random Assignment: Incidence figures provided by the State Board of Health suggest that there were 80-90 deaf and hard-of-hearing children between birth and 12 months of age in the Indianapolis area.

Currently a community awareness program is in operation to identify deaf and hard-of-hearing children. In addition, and as mentioned, birth certificates are being screened for at-risk identifiers including low Apgar scores and low birth weights. Thus, it is expected that 50 hearing impaired children between birth and 12 months of age could be identified over a two year period.

After the regional coordinators have obtained informed consent agreements from the children's parents, the project coordinator transmits them to the EIRI coordinator along with the hearing and age data. The children who are referred are then placed into 1 of 4 cells through stratification as follows:

	6-12 months	12-18 months
50 - 70 dB		
70 > dB		

If the child is the first child identified in a particular cell, a die with numbers 1 through 4 appearing on it is rolled. The number that appears on the die determines the assignment for that child and the next three children in that cell as indicated below. This process is repeated for each "new" cell, or each new set of four children within a cell.

# Appearing on Die	Assignment Pattern
1 =	BABA
2 =	ABAB
3 =	BAAB
4 =	ABBA

Where A = Early age-at-start
B = Late age-at-start

All assignment to groups is made by the EIRI coordinator to ensure that local program staff have no knowledge of where a particular child will be placed.

Additionally, the dates in which children are identified are carefully tracked to ensure that children are assigned in the order in which they were identified.

Subject Attrition: Because this study has been only recently started, and because few subjects have been assigned, attrition has not occurred. If and when attrition does occur, however, records will be kept of the dates of drop out, reasons for drop out and any other information which will be useful in analyzing a potential drop out subgroup.

EXPERIMENTAL INTERVENTION: In the regions selected for the study, services are currently provided only for children 2-1/2 to 5-1/2 years of age. This study expands current services by providing intervention for children from 6-18 months of age.

Earlier Intervention Group: Subjects 6-18 months of age will comprise this group which will participate in a once per week home treatment session which lasts approximately 60 minutes. The SKI*HI curriculum will be used during these sessions and will utilize parent advisors who visit each home to teach parents how to interact with their hearing impaired children. The objective of the intervention is to teach parents methods for developing auditory skills, communication ability and methods for improving parent-child interactions. Skill building is organized around naturally occurring activities and materials in the environment. During visits, parents are asked to demonstrate what they have been doing with the child with respect to each of the suggestions made during previous visits. At this time, any necessary remediation is given before progressing to new objectives. In addition, a monthly parent conference will be held for the families of the children in the early intervention group. The content of the parent conferences will include medical and audiological follow along, hearing-aid care and use, social and interpersonal interaction, communication, and auditory and oral training.

At 2-1/2 years of age, the children will enter the Indiana School for the Deaf 3-5 day per week preschool program. This program emphasizes language, cognition and social development and focuses on more structured activities designed to continue and supplement the auditory and communication training children have been receiving at home. Additionally, this program emphasizes preacademic skills, peer interaction and independent working ability which is necessary for entrance into a public school program for hearing impaired children.

Delayed Intervention Group. Parents of children who are 18 to 24 months of age will comprise this group and they will receive a monthly telephone call from a professional which will last approximately 30 minutes. During this contact, the caller will inquire as to how the child is doing at home and if the parents have any questions about additional services in the area. The caller will assist the family, when necessary, in identifying contact people in the area who can help meet their needs. No formal intervention will occur with this group, however, until the children reach 2-1/2 years of age when they will be enrolled in the current preschool program mentioned above. They also may participate in the parent conference.

Optional Services: Several optional services are provided equally to the two groups. These include medical and local service agencies which are available to parents, in addition to the parent group meeting held every 4-6 weeks. The extent of their participation will be monitored by completion of the Additional Services form at posttest.

TREATMENT VERIFICATION: A number of procedures are being used for purposes of verifying that the treatments are being implemented as intended. First, initial agreements are being made between the EIRI coordinator, the Indiana School for the Deaf coordinator, the regional coordinators and the individual interventionists pertaining to the actual types of services which will be provided, the intensity and duration of these services, record keeping of each child's activities pertaining to these services, attendance records and any other records which may facilitate a detailed description of each of the treatments as they are provided to the children and their families. Second, the research coordinator in Indiana will closely monitor the activities of the interventionists, keeping a record of their home visit activities, periodically accompanying interventionists on home visits in order to provide feedback on their approach, and other monitoring activities on a regular basis. Third, the research coordinator will correspond with the regional interventionists at least once a week, to discuss new subject enrollment, testing, any service delivery difficulties and to transmit communications from EIRI pertaining to attendance data, attrition and/or new enrollments. Fourth, the EIRI coordinator will be in weekly communication via telephone with the Indiana School for the Deaf coordinator (the research coordinator) to discuss any concerns raised by any of the interventionists as well as any of the issues detailed above. Fifth, both the Indiana School for the Deaf and EIRI coordinators will make periodic site visits (the Indiana School for the Deaf coordinator will visit more frequently than the EIRI coordinator, but will report the events of each visit to the EIRI coordinator). These sites visits will include meetings with interventionists. Sixth, as was mentioned, daily attendance records will be kept and submitted to the EIRI coordinator on a monthly basis. These records will include information about daily attendance, the length of each session and a listing of all staff involved in each session. Seventh, parents will be reporting by means of weekly postcards how much time they spend with the program staff and how much time they spend working with their child on suggested activities. Eighth, a formal site review will be conducted annually. This will be discussed further in the following section.

SITE REVIEW: A formal site review will be conducted annually by the EIRI coordinator to ensure that treatments are being implemented as intended and that all predetermined procedures are being followed as specified. The site review will consist of the following: a cumulative review of at least six subjects' folders, direct classroom and home visit observations, interviews with interventionists, and interviews with at least three parents.

DATA COLLECTION: Several measures have been selected to examine the effects of the two intensities of intervention with the hearing impaired subjects. The focus of the data collection is on assessing language development, family adaptation and cognitive/social development.

Pretest. Parents of each child participating in the study will complete an informed consent form and provide demographic information. Although the Battelle Developmental Inventory (BDI) was not specifically designed for use with the hearing impaired population, an adaptation of the BDI which has been developed for administration to hearing impaired children will be used in this study because several of the BDI domains are especially relevant (cognitive, communication, and personal/social). Additionally, parents will complete the Parenting Stress Index, Family Support Scale, Family Resource Scale, the Family Inventory of Life Events and Changes, and the Family Adaptability and Cohesion Evaluation Scales. These measures will primarily be used to establish pretesting levels of family functioning which will be used as covariates in the analysis as well as to investigate whether certain types of families or certain types of children profit more from intervention than others.

The BDI will be administered by a trained diagnostician who is unaware of the child's group assignment. Testing will occur at the center, ensuring that the testing environment is equally unfamiliar to all subjects. The parent, usually the mother, will complete the family measures following completion of the BDI. The Family Support Scale will be given to the mothers to take home if they have a spouse or spouse equivalent who can complete it. The diagnosticians will complete the testing report and then copy and send all data to the site coordinator who will copy and send all data to EIRI via certified mail.

Posttest. The core posttest measures will be collected in the spring of each year and will consist of the BDI and the other parent measures discussed above. Additionally, a parent satisfaction with the treatment questionnaire and parent report of child's health will be administered to the parents. Complementary measures have been chosen to reflect gains made in language ability as well as social gains. These gains are expected to be the result of the expanded services treatment which heavily emphasize language and grammatical development and which provide children with the opportunity to interact with their peers on a daily basis. Measures selected include the Peabody Picture Vocabulary Test, the Meadow Kendal Social Emotional Developmental Inventory for Deaf Students, and the Grammatical Analysis of Elicited Language Test (GAEL) which will be used after the toddlers enter their respective preschool programs.

DATA ANALYSIS: Data analysis will be conducted on pretest measures comparing the two treatment groups. Additionally, pretest analyses will include comparisons across each strata. Posttest data analyses will be conducted using the pretest data as covariates in order to control for any preexisting differences between treatment groups. Chi-square analyses will be performed as well as regression analyses on age and degree of hearing loss.

FUTURE PLANS: Thirty-five more subjects will be enrolled by May 1, 1988, for a total of 40 subjects; an additional 10 subjects will be enrolled between June 1, 1988 and September 1, 1988. The development work on the birth certificate screening project that will be used as the tool for identifying hearing impaired babies is essentially complete. It is anticipated that the first quarter of the 1988 fiscal year will be spent fine-tuning the implementation of that project. Cost analysis data will continue to be collected while the treatment is being implemented.

NEW ORLEANS ASSOCIATION FOR RETARDED CITIZENS
Project #12 (Program Variation)

COMPARISON: Severely Handicapped Infants--Center-based developmental intervention delivered by paraprofessionals trained through an inservice model vs. center-based developmental intervention delivered by paraprofessionals trained through an intensive, in-classroom model.

LOCAL CONTACT PERSON: Patricia Welge, Project Coordinator, Human Development Center, Louisiana State University Medical Center

EIRI COORDINATOR: Mark Innocenti

LOCATION: New Orleans, Louisiana

DATE OF THE REPORT: 9-8-87

RATIONALE FOR THE STUDY: There is a chronic and critical shortage of certified personnel in early childhood special education (McLaughlin, Smith-Davis, & Burke, 1986). As a result of this shortage, it is not uncommon to have noncertified personnel providing services to young children who are handicapped. This shortage is especially acute in rural areas and inner city areas (McLaughlin et al., 1986). The question that arises is "what are the most effective training procedures for preparing these noncertified individuals to teach?"

Noncertified individuals, or paraprofessionals, will be defined as any individual, including those with a university degree and/or formal certification, who is providing services to a child in an area that he/she is not specifically certified (Pezzino, 1984). According to this definition, a certified teacher providing occupational therapy services to a child would be considered a paraprofessional, with regard to those services.

Research on the effectiveness of paraprofessionals has demonstrated that paraprofessionals can teach new skills to handicapped children (Fredericks, Baldwin, Moore, Templeman, & Anderson, 1980; Guess, Smith, & Ensminger, 1971; Phillips, Liebert, & Poulos, 1973; Schortinghuis & Frohman, 1974; Shearer & Shearer, 1972). A difficulty with the majority of this research is that intervention vs. no intervention was compared, and, therefore, it is difficult to induce what paraprofessional training procedures are the most effective. In these studies, little information on the skills of the paraprofessional was presented.

The most commonly used training procedures for paraprofessionals consists of orientations and inservice sessions (Frith & Lindsey, 1982). Research studies investigating these common approaches generally provides information only on changes in teacher knowledge and teacher attitudes (Farrell, 1982; Johnson & Ferryman, 1969). Information that has been presented on teacher behavior as esult of this inservice, classroom-type training has not been positive (Farrell, 1982).

An alternative to this inservice training mode for paraprofessionals is the therapy consultant model (Striefel & Cadez, 1983). With this model, a certified professional provides the assessment of, and programming for, a handicapped child. The professional trains the paraprofessional in the implementation of a program and in data collection practices until the paraprofessional meets a specified criteria. The paraprofessional then takes over the program. The professional makes regular contacts with the paraprofessional to observe the implementation of the program, provide feedback (and retraining if necessary), check the program data, and make program changes as needed. A variation of the therapy consultant model was used by the Social Integration Project to provide services to handicapped children integrated into a daycare center where the primary teaching staff were paraprofessionals (Rule, Killoran, Stowitschek, Innocenti, & Striefel, 1985; Rule, Stowitschek, Innocenti, Striefel, Killoran, Swezey, & Boswell, 1987). Handicapped children in the Social Integration Project demonstrated significant skill increases while the program and teacher attitudes were positive toward the program (Rule et al., 1987).

The study will contrast two types of paraprofessional training in a center-based service program. The Association for Retarded Citizens (ARC) in New Orleans currently provides center-based developmental intervention services for handicapped children from birth to three years of age. The ARC provides services in an inner city area and uses paraprofessional staff to implement the program. The ARC was separated into two programs for this study. One program carried on without change (the basic program). In this program, staff are trained through regular inservice sessions. The other program was augmented (augmented program) through training from professionals using a variation of the therapy consultant model. Training for the augmented program focused on increasing the structure of the program and on the systematic application of developmental learning principles. Results of this study will provide information on the effect of these different training procedures on intervention success. In addition, information on the cost-effectiveness of these two different training intensities will be provided.

PROGRAM ORGANIZATION: This study is conducted through the New Orleans Association for Retarded Citizens (ARC). The ARC is a non-profit United Way agency and is affiliated with both the National ARC and Louisiana ARC. The ARC is governed by a board of directors composed of experts in the field of education for the handicapped, consumers of the services, and people in the community. The ARC receives funding from United Way and the Louisiana Office of Mental Retardation and Developmental Disabilities. The ARC is the largest provider of services to children with handicaps who are from birth to three years of age in the greater New Orleans area. The ARC operates three centers to provide services to children (the Main, Jefferson, and West Bank sites), and operates a work activities center for adults with handicaps at the Main site. The ARC provides advocacy services for the handicapped, provides parent training services, and operates an information cooperative.

The ARC offered the participation of all of their sites for this research study. The ARC offers a five-day-per-week center-based program that operates from 9 a.m. to 3 p.m. for all children in the population they serve.

SUBJECTS: Forty-five children between 10 and 34 months of age (mean = 23.49, SD = 6.8) participated in the first year of the study. Subject recruitment for the Year 1 cohort was completed in October of 1986. The majority of the subjects have been labelled organically impaired and approximately one-third are multiply handicapped. Approximately 70% of the subjects are Black. The majority come from low SES families and 58% from single parent families. The age of the majority of mothers of the children in this study are in their late 20s or early 30s (mean age = 31.7, SD = 7.4). All the mothers have, at a minimum, some high school education (mean grade completed = 12.4, SD = 2.1).

Criteria for Inclusion: The criterion the ARC uses to identify a child as handicapped has been established by the Louisiana Office of Mental Retardation and Developmental Disabilities. This criteria qualifies a child as handicapped if they exhibit a mild delay in two or more developmental areas, or a severe delay in one or more developmental areas, or has a condition diagnosed by a physician that may lead to life-long developmental delays. Even with this criteria, the majority of children identified for service at the ARC have more involved handicaps. This is partly due to the fact that parents serve as the referral source.

Children and their families who were already identified as handicapped and were scheduled to participate in the ARC program were considered for inclusion in the study. Services at the ARC are provided on a first come, first served basis until all their slots are filled. A waiting list did exist for ARC services at the time this study began. From this pool, subjects were included in the study based upon parents' willingness to participate prior to knowing which treatment group they would be assigned. Informed consent to participate in this study was obtained from the parents. Parent failure to provide informed consent did not exclude a child from receiving services at the ARC.

Subject Identification and Random Assignment: After pairing the classes at each site (so that each site would have an equal number of classes assigned to the two conditions), a class was randomly assigned to either the basic or augmented condition and its pair-mate was assigned to the other treatment condition. This was accomplished with coded information so that there was not any knowledge of which teacher was associated with which class. Next, the children at each site were categorized by six month age groupings. Independently, another set of researchers, who were familiar with the children's handicapping conditions, categorized children into three functional levels ranging from least to most impaired. Based on these categorizations, children were paired by functional level within age category (a 6 x 3 matrix). If pairings were not possible using this procedure, children within the same age categories were paired with children in an adjacent functional level category. If that procedure was not possible, children within the same functional level categories were paired within adjacent age categories. This procedure resulted in 10 pairs of children being assigned who were in both the same age and functional level categories. After all pairings were accomplished, a random procedure (coin toss) was implemented to assign one member of each pair to the basic condition and the corresponding pair member to the augmented condition.

Attrition: Initially 54 subjects were recruited to participate in the study. Eight subjects have dropped from the study to date shortly after pretesting. One child moved before the end of the study and subsequently transferred into another program; this subject will not be posttested.

EXPERIMENTAL INTERVENTIONS: The interventions consisted of a continuation of services as they had been provided in the past (basic condition) where classroom staff only received training through regular inservices. The basic services were augmented, in some classrooms, through in classroom training to classroom staff from certified consultants (a speech and language therapist and an occupational therapist). The following section describes these two interventions.

Basic Condition: In the basic condition, a typical classroom contains eight children served by a teacher and an aide. Both the teacher and aide are noncertified, and both work directly with the children. Teachers in a classroom are selected based on their experience with the ARC or other similar experiences and education. All children are provided with an Individual Habitation Plan (IHP) that lists child goals. Instructional activities occur throughout the day, but no daily systematic learning plans are available. This creates variability in the type and frequency of instruction within a class and across classrooms. The lack of a systematic strategy results in teaching practices being implemented that would not be considered "best practice" in special education. For example, instructional activities which are implemented in the basic classes are often not related to child goals, child progress through instructional sequences are often not data based, and appropriate teaching techniques are not consistently applied. Educational materials exist in these classrooms, but are not adequate to meet all child goals.

These classrooms use no established curriculum or weekly theme to base their activities. The teacher for each classroom establishes a daily schedule where activities are listed by general developmental areas; for example, gross motor time, fine motor time, cognitive time, etc. Activities occurring during this time are teacher dependent. Individualized (one-to-one) activities are not regularly planned in these classrooms with the exception of gross motor time. Other individualized activities occur, but not systematically. During gross motor time each child receives some individualized instruction. During times when teachers work individually with a child, no planned activities occur for the other children.

Augmented Condition: In the augmented condition classes, subjects attend the same ARC program for the same number of days and for the identical number of hours as the subjects in the basic condition, however, teachers and aides delivering services to subjects in the augmented condition receive extensive classroom-based consultation services from an interdisciplinary team from Louisiana State University's Human Development Center. The interdisciplinary team consists of a special educator, a speech and language therapist and an occupational therapist. The Louisiana Curriculum for Infants with Handicaps, which is designed to generate appropriate, individualized programs for each child in several developmental and functional areas, was installed by the team. This was accomplished through training classroom staff in the goals of the curriculum and how to implement treatment programs derived from the curriculum. In addition, the team provided training to the staff in the use of incidental teaching techniques (Hart & Risley, 1968, 1974, 1975), a technique for extending the use of language skills by requiring children to use language during naturally occurring opportunities, and in how to develop group individualized instruction plans. The team also provided materials and equipment, such as language cards, for programs to help children meet learning goals. During regular visits to the classrooms, team members modelled appropriate teaching techniques with the children for the staff. They observe teachers and aides in their teaching interactions with children and provided feedback.

The daily classroom schedule is determined by curriculum activities in the augmented classes. Although children receive instruction in groups, the groups are individualized so that each child receives instruction related to individual needs. The LSU staff provide daily scripted plans for these group activities. All children in the augmented condition also receive 20 minutes of individualized programming per day. During individualized activities the other children work at thematic play centers where incidental teaching of functional skills (language and social skills) occurs. LSU staff visit each classroom a minimum of once per week to work directly with classroom staff.

TREATMENT VERIFICATION: This study, and the other EIRI studies, have implemented a number of procedures to verify that treatment is being implemented as intended. One method to verify that treatment is received is to collect child attendance data. If a child does not attend a program regularly, then evaluating treatment effectiveness is confounded by their absence. Daily records on attendance are kept by ARC staff and these records are forwarded to EIRI on a monthly basis. These data can, at posttest, be used as a factor in determining treatment efficacy.

Another aspect of treatment verification is related to ensuring that the people working with the children (the intervenors), classroom staff at the ARC classrooms, are implementing the treatment as intended. Observations of teachers and aides, in the basic and augmented groups, are being conducted as part of the verification process. Data on teacher skills and on the structure of their teaching interventions are being recorded. In addition, teachers are evaluated annually by their ARC supervisor. This evaluation provides a rating of the teacher's skills on a teacher evaluation checklist and a qualitative ranking of the teacher in comparison to other teachers that the supervisor is working with. These verification procedures will provide a means to determine if the skills possessed by classroom staff vary across the two conditions.

A final aspect of treatment verification being conducted deals with the parents of children who are receiving services. If the parents are receiving services from other sources, then the treatment being presented may be compromised. To control for this, parents provide a report of additional services they are receiving; this is done annually. Parent satisfaction data are also recorded as part of the treatment verification procedure.

SITE REVIEW: A site review was conducted at the New Orleans ARC Program on April 24, 1987. The purpose of this review was to collect information about the nature and quality of early intervention services that are being delivered at the

ARC, to verify that the research being conducted by EIRI is being implemented as intended, and to collect needs assessment data which may be useful to site administrators seeking technical assistance. This review was conducted by the EIRI Site Coordinator, two staff members from Louisiana State University (LSU) Human Development Center, a parent whose handicapped preschooler was participating as a subject, and two members of the New Orleans ARC (including the ARC Director). The site review took place at two of the three ARC sites and included a review of the cumulative folders of six subjects, direct classroom observations, interviews with teachers, and interviews with three parents.

Based on the data obtained during the site review, it appears that the New Orleans ARC is providing a generally positive experience for the children it serves. For all children, eligibility criteria were in place and those reviewed met those criteria. Appropriate assessment reports were in place. For children in the augmented condition, appropriate IHPs, lesson plans, and instructional data collection procedures were in place. For children in the basic condition, IHPs were in place and teachers had indicated that goals were being met. For children in the basic condition, several IHP features were not present. Specifically, there was no description of the special services children were to receive, nor was there a description of the extent to which children would participate in a remedial program. The IHPs of all children in the basic condition had specific evaluation criteria stating the degree to which an objective must be obtained, but these were similar across children.

The review team observed positive and appropriate interactions among children and staff in both the augmented and basic conditions. Inappropriate disciplinary methods or punishment procedures were not observed. It was observed that the staff encouraged appropriate prosocial behaviors. It was the opinion of the review team that the staff in the augmented condition encouraged developmentally appropriate activities on a more consistent and more frequent basis than staff in the basic condition; this would be in accord with their use of a developmentally sequenced curriculum.

In the augmented condition, the Louisiana Curriculum for Handicapped Infants had been implemented, staff had received inservice training in its use, and it was observed to be in use. In the basic condition, it was less clear as to what curriculum, or plan, was in place for activities that occurred.

The administration and management of the ARC site was reviewed and found to conform to legal standards set by PL 94-142. The team suggested ways to improve parents understanding of PL 94-142 safeguards. Procedures for evaluating staff were reviewed and it was recommended that evaluation procedures be modified to help attract and maintain qualified and competent staff.

The physical arrangement of the ARC sites was reviewed. Evaluation of the physical arrangement included these factors: Environments are safe and clean. Space is sufficient and arranged to accommodate a variety of groupings. A variety of toys and equipment are available. Environment includes soft elements (e.g., rugs, cushions). The outdoor area is protected from access to the streets and other dangers. Two of the three sites scored well on all these criterion. The third site adequately met these criteria. Suggestions for improvements were made.

Overall, the ARC program was found to be in compliance with PL 94-142. Program staff interacted in an appropriate manner with all children. The physical arrangement of the ARC classrooms was found to be adequate. The most notable differences were found in those factors that would be expected to differentiate the basic condition from the augmented condition.

DATA COLLECTION: The following section describes the data collection procedures used for this study.

Core measures: The following core measures are used at all test administrations. All children in the study are administered the Battelle Developmental Inventory (BDI). The BDI serves as the primary measure of child development. Parents of children in the study complete the following scales of family functioning: Parenting Stress Index, Family Support Scale, Family Resource Scale, Family Inventory of Life Events, and the Family Adaptability and Cohesion Evaluation Scales. Family functioning has been an overlooked area of early intervention research (Casto & Mastropieri, 1986) and, thus, a variety of family functioning instruments are being used to detail changes that may occur given different types of early intervention services. These measures will also allow the determination of services that are more beneficial to certain types of families. Based on pretest data, core measures may also be used as covariates in future analyses.

Pretest: The BDI was administered by a trained examiner who was unaware of the child's group assignment. Testing occurred at each child's respective school prior to beginning the study. Mothers completed the family measures and were paid a $20 incentive for doing so. Married mothers and those with spouse equivalents were also given an additional copy of the Family Support Scale to be completed by their spouse. The mothers also provide demographic information. Testers were available to answer questions regarding test items.

Posttest: Posttesting occurred at the end of the school year during the last 3 weeks of July and the first week of August. Posttesting for the Year 1 subject has been completed and is currently being coded for analysis purposes. The posttest battery consists of the core battery of tests and surveys as well as some additional measures. The additional tests and surveys include the Early Intervention Developmental Profile (EIDP), a videotape sample of developmental goals, the Interactive Communication Inventory (ICI), and a survey of child health. These measures were selected to compliment the primary measures for this population and type of intervention.

The EIDP provides an additional measure of child developmental progress. The EIDP is based on a listing of developmental skills and provides a more thorough breakdown of skills by age level than is available through the BDI. With the severity of handicaps of children in this study, the EIDP may be more sensitive to child gains than the BDI, and, thus, a more accurate indicator of child change. The videotape will provide a sampling of teacher skills. Skills that teachers demonstrate should be directly related to experimental condition. This will serve as one measure of treatment verification. In addition, skills demonstrated by children can be correlated to goals on their IHPs to determine if goals were accurately assessed. Communication skills were a primary focus of the Augmented Condition, and the majority of children enrolled in the ARC exhibited language delays. The ICI will allow for a detailed assessment of child language skills.

Due to the primary SES status of the children in this study, more health problems may occur than in the general population. Health problems can interfere with developmental progress. The health survey will provide a means to determine if individual health problems may have affected measures of developmental progress. The posttest measures were administered by trained test examiners who were ignorant of subjects' group assignments. Parents were paid a $40 incentive for completing the posttest battery. Test examiners were available to answer parent questions on surveys.

Assessment Management: Four local test examiners were trained to administer the pretest and posttest BDIs. All BDI test examiners are staff from the LSU Medical Center. Prior to certifying the examiners as competent BDI administrators, they demonstrated appropriate knowledge and use of the BDI to an EIRI designated certifier. These examiners also administer the EIDP and ICI at posttest. Testing is scheduled directly with the examiners by the LSU site liaison. Shadow scoring of 10% of the BDI, EIDP, and ICI test administrations is conducted by the site liaison and by other test examiners. No problems in test administration or scoring have been revealed by this process, and interrater reliability data reveal an average coefficient of .89. All examiners are ignorant of the subjects' group assignments. Although all work at LSU, none work with the ARC. Parents are not allowed to discuss their surveys prior to or during these sessions to prevent examiners from inferring the subjects' group placement.

DATA ANALYSIS: Results of the pretest data analysis are presented in Tables 3.28 and 3.29. These data are based on 46 subjects (45 posttested subjects and the one who received services by moved during the year). Table 3.28 presents descriptive data on the subjects and their mothers, and presents pretest results on parent measures. Statistically significant differences occurred on the child score of the Parent Stress Index (PSI), the Family Resource Scale time score, and the FACES cohesion score. These differences indicate that (a) parents of children in the augmented group perceive their child as having more stress than percent of children in the basic group, (b) parents in the augmented group have more time for sources of support than parents in the basic group, (c) families of children in the augmented group are more cohesive than families of children in the basic group. It should be noted that these differences may be spurious. Completing multiple t-tests, as was done here, sometimes results in perceived significance where none may exist. The level of significance of the above measures suggests this possibility with the present data. Regardless, measures may be used as covariates in the posttest analyses, if appropriate.

Table 3.29 presents BDI pretest raw scores. No significant differences were found in any domain or subdomain.

Table 3.28

Descriptive Data and Pretest Results on Parent Measures

Measure	Basic Group*	Augmented Group*	t	p
Child Age at Start (months)	24.2 (6.7)	22.5 (7.4)	0.78	0.44
Mother's Age (months)	368.9 (83.5)	391.9 (94.6)	-0.79	0.43
Mother's Eduation	11.8 (2.1)	12.7 (2.1)	-1.44	0.16
PSI - Parent	246.9 (39.3)	260.8 (32.3)	-1.30	0.20
PSI - Child	113.2 (19.4)	124.9 (14.9)	-2.28	0.03
PSI - Total	133.7 (27.1)	136.0 (27.4)	-0.29	0.77
FSS - Total	30.8 (12.2)	32.9 (11.7)	-0.60	0.55
FSS - # of Resources	15.9 (3.1)	17.0 (2.4)	-1.37	0.18
FRS - Total	106.2 (14.1)	114.9 (20.6)	-1.60	0.12
FRS - General	67.3 (10.2)	73.3 (15.0)	-1.60	0.12
FRS - Time	35.3 (7.3)	40.6 (9.6)	-2.13	0.04
FRS - Physical	28.7 (4.9)	29.2 (6.3)	-0.31	0.76
FRS - External	22.2 (4.2)	22.9 (6.0)	-0.50	0.62
FACES - Discrepancy	14.5 (13.0)	10.3 (12.6)	1.13	0.27
FACES - Cohesion	34.2 (7.9)	38.9 (6.7)	-2.15	0.04
FACES - Adaptability	21.4 (6.8)	23.3 (6.6)	-0.98	0.33
FILE - Total	11.1 (7.1)	11.2 (6.3)	-0.05	0.96

* Number represent mean scores; numbers in parentheses represent standard deviation.

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores idicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and Adaptability scores indicate greater amounts of these factors.

Table 3.29

Battelle Pretest Raw Scores

Measure	Basic Group*	Augmented Group*	t	p
Personal/Social	29.0 (14.3)	34.9 (10.6)	-1.51	0.12
Adaptive	26.6 (12.2)	28.3 (10.1)	-0.50	0.62
Gross Motor	19.2 (13.3)	24.4 (12.3)	-1.36	0.18
Fine Motor	12.3 (8.5)	13.6 (6.1)	-0.57	0.57
Motor Total	31.5 (20.9)	37.9 (17.8)	-1.11	0.27
Receptive Communication	9.9 (3.9)	9.9 (2.8)	-0.03	0.97
Expressive Communication	9.6 (5.7)	8.7 (4.4)	0.59	0.56
Communication Total	19.5 (9.2)	18.6 (6.6)	0.36	0.72
Cognitive	14.0 (8.3)	15.7 (5.4)	-0.81	0.42
Total Score	120.8 (62.2)	135.4 (45.1)	-0.91	0.37)

*Numbers represent mean scores; numbers in parentheses represent standard deviation.

Posttest data are currently being scored and coded for analysis purposes. These data will be ready for analysis in the near future.

FUTURE PLANS: Plans to continue this study are currently under consideration by the new ARC administration. Letters and discussion regarding the requirements of the study and obligations of research and ARC staff have been outlined. Agreement to continue the study has been tentatively given pending the approval of the ARC Board of Directors. The implementation of the study would be similar to that described for 1986-87. Some changes in classroom allocation may occur based on ARC enrollment figures.

There are 15 subjects who were in the study last year and would continue in the study (7 basic, 8 augmented). These children would continue in the same experimental condition. Up to 49 new children could then be enrolled as new subjects; this figure may vary depending on classroom allocations. Teachers would remain in the same experimental condition they were in last year. A basic and augmented service would continue to be provided.

Continuation of this study would provide for a better evaluation of the experimental conditions. The study will be conducted over an entire school year, rather than a six-month period. Teachers in the augmented condition are already trained, and teacher learning effects on subject behavior would be reduced. Inclusion of ecobehavioral measures (cf., Greenwood, Delquadri, Stanley, Terry, & Hall, 1985) is also being investigated. Data on the utility of the EIDP and ICI will be available and alternate measures will be considered.

Procedures to follow the "graduates" of the ARC have begun. The 30 "graduates" are going on to noncategorical public preschools in the Orleans and Jefferson parishes. The site liaison is establishing contacts with these parishes through a community services coordinator at LSU. It is required that all LSU research interactions with the parishes are mediated by this coordinator. In addition, steps to follow the parents have been initiated. Parent thank-you notes are being sent to all parents. Included with these is an address card to be returned to the site liaison. Parents will be asked to update the card as necessary. Another card will be sent during the middle of the year and again prior to the first follow-up testing. This system will allow the tracking of parents. Cost data for the program and for later school placement will be collected and analyzed.

DES MOINES PUBLIC SCHOOLS
Project #13 (Program Variation)

COMPARISON: Mildly to Severely Handicapped Children--Center-based intervention plus parent intervention vs. center-based intervention only

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Phone: (515)277-6238

EIRI COORDINATOR: Jim Pezzino

LOCATION: Des Moines, Iowa

DATE OF REPORT: 9-9-87

RATIONALE FOR THE STUDY: This study investigates the short- and long-term effects of a behavioral parent training treatment in combination with a treatment designed to empower parents to better procure support and resources related to basic family functioning. The study is being conducted because there is a lack of knowledge regarding the effects of behavioral parent training on the actual performance of young handicapped children and because there is an increasing recognition that a narrowly focused intervention, especially when applied to the parents of severely handicapped children, is not likely to succeed unless the broader needs of the family are adequately addressed and met.

Over the years, findings from parent studies with handicapped children have generally reported positive results (e.g., Baker, 1976); however, many of these studies suffer from procedural limitations and methodological problems (Kaiser & Fox, 1986). For example, we have located only two studies which have assessed parent mastery of behavioral principles and procedures and actual application of these principles and procedures with the child (Heifetz, 1977; Watson & Bassinger, 1974). A typical methodological limitation found in this area is illustrated by a frequently cited study conducted by Baker, Heifetz, and Murphy (1980), in which positive changes in parent and child behaviors over a 14-month period for three types of behavioral training procedures were reported. Unfortunately, these findings were based solely on parent reports via phone interviews.

Another limitation of most parent studies with handicapped children conducted to date is that findings are typically related only to short-term changes. Very few studies have attempted to investigate the long-term effects of behavioral parent training with parents of handicapped children (Baker, 1976; 1980; Lutzker, McGimsey, McRae, & Campbell, 1983).

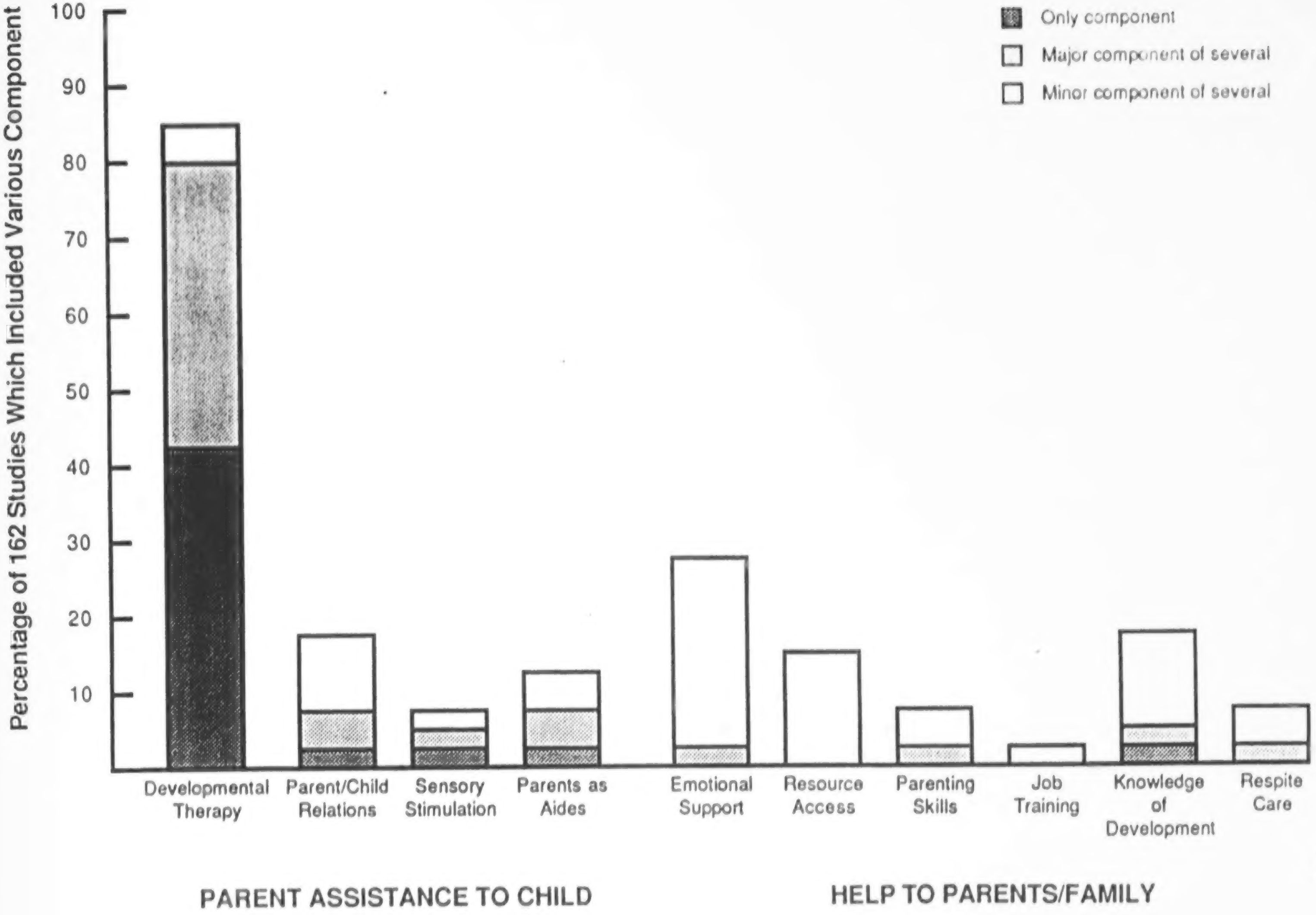
Although there are many unanswered questions regarding the efficacy of behavioral parent training treatments, a continuing focus on parent training interventions is justified on logical and empirical grounds. For example, most professionals believe that it is more efficient to teach parents to modify their child's behavior than to depend solely on direct intervention by professionals, and there are numerous studies which claim the successful modification of child behavior as a function of training parents in the application of behavioral procedures (Gordon & Davidson, 1981). Unfortunately, research on the efficacy of these parent training interventions have not typically included an assessment of their possible impacts on family functioning nor have they been investigated in combination with interventions designed to improve family functioning. The difficulties facing families with young severely handicapped children are particularly challenging ones. Families of handicapped children are likely to be highly stressed (Gallagher, Beckman, & Cross, 1983) and in need of assistance so that they can continue to functioning as a family unit per se. The importance of demonstrating the feasibility and effectiveness of parent training treatments in ecological context is being increasingly emphasized by a number of researchers (e.g., Blacker, 1984; Kaiser & Fox, 1986)

One of the difficulties in doing research on the effectiveness of various types of parent involvement programs in early intervention is the definition of what constitutes parent involvement. Gatling and White (1987) defined two general types of parent involvement programs: (a) those that use parents in some way to enhance the handicapped child's developmental progress and (b) those that provide assistance to parents or other family members to enhance family functioning, coping ability, satisfaction, or ability to manage the stress of having a handicapped child as a family member. Based on their analysis of 162 previously completed early intervention studies which included a substantial family involvement component, Gatling and White (1987) further subdivided these two general areas as shown in Figure 3.1 and determined the frequency with which each type of parent involvement had been included in previously reported research.

The results of that analysis are both enlightening and provocative. First, as shown in Figure 3.1, it is clear that most parent involvement programs have focused primarily on using parents as developmental therapists with their child. Secondly, programs to provide assistance and support to nonhandicapped family members have been used very infrequently. Based on this analysis, the parent involvement component for this intervention study was structured to include those components which had been used most frequently in past research (i.e., 81% of all previous studies used parents as a developmental therapist for their child as either the sole or primary component of the parent involvement component). In addition, we included a component designed to enhance family functioning, given the very strong philosophical support for this in recent literature. Thus, the resulting parent involvement program is targeting on enhancing functioning of both children and families.

PROGRAM ORGANIZATION: Subjects participating in this study are served through the Des Moines Public School System. Des Moines Public Schools currently serve over _____ handicapped preschool children from birth through five years of age. (The State of Iowa has had a law mandating a free and appropriate public education to children birth through five since 1975.) Handicapped children in the Des Moines Public Schools ages 0-2 are typically served through home-based intervention programs, while handicapped preschoolers ages 3-5 typically receive intervention

Figure 3.1


Percentage of 162 Studies Which Included Various Component
100
90
80
70
60
50
40
30
20
10
▨ Only component
☐ Major component of several
☐ Minor component of several
Developmental Therapy
Parent/Child Relations
Sensory Stimulation
Parents as Aides
Emotional Support
Resource Access
Parenting Skills
Job Training
Knowledge of Development
Respite Care
PARENT ASSISTANCE TO CHILD
HELP TO PARENTS/FAMILY

services in center-based settings. The general philosophy of the Des Moines Public Schools is to provide high-quality educational services which maximize each child's individual potential. Programs are developed based on comprehensive individual assessments conducted by multidisciplinary teams. Parents are required to participate in the development of Individualized Education Plans and are strongly encouraged to become involved with the educational process.

Subjects participating in this study are served at Phillips, Findley, and Perkins schools. This represents three of four schools in the Des Moines Public School system in which handicapped preschoolers are served. These specific schools were selected because teachers and professional support staff (Psychologists, Speech Therapists, Occupational Therapists, Social Workers) who work in these schools volunteered to conduct this research in collaboration with EIRI. The liaison person at the Des Moines site who is responsible for coordinating the day-to-day activities of the research study is a psychologist employed by the school district who has responsibilities at each of the three participating locations.

SUBJECTS: Fifty-seven children are currently enrolled in the project. Their ages at time of enrollment ranged from 35 to 71 months (mean = 52.55 SD = 11.74). Subject recruitment for this cohort of subjects (originally 64 subjects were recruited) was completed in October of 1986, and posttesting of this sample was completed in June, 1987.

Over 90% of children served are Caucasian and represent a wide variety of SES levels. Children participating in the study are moderately to severely handicapped, exhibiting a variety of handicapping conditions such as Down syndrome, Cerebral Palsy, hearing and vision impairments, and other significant developmental delays. Descriptive and pretest data for subjects who were posttested in the spring of 1987 are presented in Tables 3.30 and 3.31. Note that the non-parent training group and the parent training roup are generally comparable, with the exception that maternal

Table 3.30

Group Comparisons of Demographic and Mother Stress Data

Variable	Non-Parent Training Group			Parent Training Group			P
	mean	SD	n	mean	SD	n	
Child's Age in months at BDI Pretest	52.52	12.33	31	51.65	11.70	26	.929
Mother's Age	28.06	5.51	31	30.38	4.42	26	.867
Parenting Stress Index Total Score (Mother)	250.06	38.87	31	248.31	42.34	26	.872
Mother's Education	11.35	2.24	31	12.85	2.22	26	.015

Table 3.31

Group Comparisons of Pretest BDI Raw Scores and Pretest Family Measures

Variable	Non-Parent Training Group			Parent Training Group			P
	mean	SD	n	mean	SD	n	
BDI							
Personal Social	107.77	23.22	30	106.38	23.49	26	.771
Adaptive Behavior	71.87	14.32	30	62.73	15.82	26	.026
Gross Motor	61.77	11.87	30	54.62	15.48	26	.058
Fine Motor	43.27	10.71	30	36.77	12.83	26	.056
Motor Total	105.03	21.39	30	91.38	26.01	26	.041
Receptive Communication	24.33	8.04	30	20.58	7.59	26	.091
Expressive Communication	29.17	10.08	30	27.00	12.03	26	.468
Communication Total	53.50	16.46	30	47.58	18.92	26	.232
Cognitive	44.13	16.59	30	40.85	17.47	26	.465
Battelle Total Score	382.30	81.94	30	348.92	93.72	26	.160
Family Measures*							
Family Support Scale Total Score (Mother)	26.33	11.11	30	31.65	11.38	26	.084
Family Resource Scale Total Score (Mother)	115.77	14.97	31	116.81	20.71	26	.833
FACES III Discrepancy Total Score (Mother)	11.51	8.97	31	12.04	8.33	26	.821
FACES III Cohesion	37.26	6.81	31	38.96	5.44	26	.298
FACES III Adaptability	22.23	7.51	31	21.19	3.19	26	.491
FILE Total Score Past 12 Months (Mother)	8.03	4.94	31	11.35	7.26	26	.055

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and adaptability scores indicates greater amounts of these factors.

education is significantly higher for the parent training group. (This factor will be used as a covariate in the posttest analysis.)

Comparisons of the Battelle Developmental Inventory scores also show the non-parent training group children and the parent training group children to be generally comparable. The two groups were not significantly different for seven of nine subscales and did not differ significantly on the total score.

Criteria for Inclusion: Children and their families who were participating in classes which were taught by six teachers who volunteered to participate in the research project were considered for inclusion in the study. From this pool, subjects were included in the study based on parents' willingness to participate prior to their knowing to which treatment group they would be assigned. Approximately 95% of the parents whose children were in one of the six classes agreed to participate on this basis.

Assignment to Groups: Subjects who met the criteria for inclusion were randomly assigned to one of two treatment groups prior to the initiation of treatment, either to a group in which parents received additional training or to a group in which parents received no additional training. Both groups continued to receive the same level of child centered services that were previously available through the school's program for handicapped preschoolers.

In order to ensure the comparability of groups, subjects were assigned to groups randomly after being stratified as follows. Within each of the teachers' classes, subjects were categorized according to chronological age (27-42 months, 43-54 months and over 55 months) and level of parent motivation (either "high" or "low") as perceived by each child's teacher. Categorizing subjects in this way resulted in subjects falling into one of six possible mutually exclusive categories. Within each of the six categories subjects were rank ordered from low to high based on their CAPER scores (the CAPER, a test of developmental functioning, was administered by school personnel at an earlier date).

After subjects were categorized, they were alternately assigned to one of the two conditions. Group determination of the first-listed subject (the subject with the lowest DQ score), in each age x motivation category was accomplished randomly. Additional subjects within the same category were then alternately assigned to groups.

Subject Attrition: Seven subjects have dropped from the study to date, resulting in a sample of 57 subjects who were posttested during June 1987. Of the seven subjects who have dropped from the study, three subjects assigned to the parent training group and one assigned to the non-parent training group moved out of the area, one subject assigned to the parent training group changed to a home-based program, and two subjects from the parent training group dropped after their mothers' indicated a lack of interest in continuing.

EXPERIMENTAL INTERVENTIONS: The purpose of this study is to compare center-based intervention plus parent training with the effects of center-based intervention alone. A description of these two treatments follows.

Center-Based Only: Children assigned to this group attend an existing center-based 1/2 day, 5-day-per-week intervention program in which they receive small group and individualized teaching sessions from special education teachers and paraprofessional aides. All teachers are certified and are responsible for supervision of their respective aides. None of the aides are certified as teachers, and their training consists mostly of periodic inservices provided by the school district, which both teacher, aides, and support staff attend, and on-the-job training provided by their respective teachers and the itinerant speech and motor therapists. Each class of approximately 10 children has one special education teacher and one aide. Because each child's program is "IEP driven," motor and speech therapist's contact with children vary widely. In general, a motor and speech therapist is present in each class for the equivalent of one day per week. During a typical day, children are instructed in the motor, speech and language, self-help, cognitive, and social skills areas. As part of the regular services to children, parents are involved in IEP meetings, and teachers occasionally visit with parents at school to discuss the progress of their children.

The CAPER, along with other curriculum linked assessment tools are used in determining intervention goals and strategies. Intervention activities are developed for comprehensive assessments and items drawn from a number of curricula. The skill sequences in the curriculum extend beyond the child's current level of functioning, and functional skill training routines are included in the curriculum to the degree appropriate. Language and motor therapists provide individualized motor and speech and language instruction to the children, and assist teachers and aides with the implementation of these activities.

Center-Based Plus Parent Training: In addition to the basic center-based service described above, children in the experimental treatment group (parent training group) receive an intensive parent training intervention. The parent training intervention is based on the Parents Involved in Education (PIE) training package (Pezzino & Lauritzen, 1986). These PIE training modules are taught by the preschool professional staff, and are designed to provide parents with a systematic conceptual and hands-on experience in such areas as child development, observation and recording, targeting intervention behaviors, teaching processes, decision making, and communicating with professionals. The training format consists of small-group lecture, discussion, and demonstrations. The average small group size is between 8 and 12 parents. Training sessions consist of approximately 15, 2-1/2 hour sessions, roughly 1 per week excluding school holidays. Training sessions also include a social support component in which parents have the opportunity to share feelings and express problems, challenges, and other issues associated with their lives. Parents are primarily responsible for determining the agenda for the social support component of the session.

In addition to these sessions, parents are asked to practice the parent intervention training at home with their children. They are asked to choose a target behavior for the child (such as buttoning), implement a short training session, and measure progress by comparing successful completion of the task before and after the intervention.

The PIE trainers are composed of the same teachers and support staff who volunteered to collaborate in the research study. Each PIE group is conducted by a team of two of these preschool staff. For example, the classroom teachers and speech therapist or a psychologist and a teacher. The paraprofessional aides occasionally attend the PIE training sessions, but they are not responsible for conducting PIE training. All PIE trainers were instructed in the implementation of the PIE by its developer prior to initiation of PIE training. The EIRI coordinator directly observed each training team in acting with parents at least once during the year to verify that it was being implemented as intended.

TREATMENT VERIFICATION: A number of procedures have been implemented in order to provide an independent verification of the specifics of the intervention program using a structured evaluation guide and identify areas where technical assistance would be beneficial. Child attendance data for basic services and parent attendance data for parents training sessions were recorded throughout the year. Child attendance was recorded daily, and parent attendance data (for the parent training group) was recorded weekly; these data were sent to EIRI on a monthly basis. A cursory viewing of the attendance data for this study shows no obvious differences in attendance for the children in the non-parent training group versus the parent training group. Parent attendance data would seem to indicate that attendance exceeding 75% was typical.

A description of quality of parent involvement was also gathered annually by a direct intervenor who worked most closely with the respective parent. The data obtained was the intervenor's perception (low, average, high) of how a parent rated on attendance, knowledge, and support. Based on our experience, most direct intervenors feel confident that they can accurately identify parents who are motivated and engage in a high quality of involvement with the child's intervention program. These data will be used in data analyses and for descriptive purposes. For example, it will be important to know if parents who were described as highly knowledgeable and motivated by intervenors, experienced greater success in implementing parent programs and/or if these programs were more effective than those conducted by other parents. While these analyses remain incomplete at the current time, it appears that most parents in this study display either average or high motivation, with only one or two parents being ranked "low." This is likely to be typical of a more general population also.

Additionally, parents in the parent training group were asked to submit weekly postcards which indicated the amount of time they spent doing instructional activities with their child. Parents in the non-parent training group were asked to submit postcards for three separate weeks during the year. Parents in the parent training group were asked to submit data records of the home intervention programs they designed based on their PIE training. Each site summarized these data and sent it to EIRI staff monthly. In order to encourage parents to consistently turn in postcards, EIRI provided a free developmental toy as an incentive for families which turn in 10 postcards consecutively. If parents were late in submitting their weekly postcards, a reminder phone call was made. If they still did not turn them in, we did not ask for them again (we did not want parents to feel badgered regarding this activity). Parent involvement data will provide useful information regarding the effects of various service configurations on how much time parents spent doing intervention-related activities, and it will be useful in assessing the effects of amount of parent time on child progress.

Being able to conduct or statistically control analyses using parent involvement data is obviously useful; however, collecting parent involvement data may have additional positive effects. It may have a motivating effect on parents, and it readily identifies some types of treatment implementation problems which may arise so that service providers can quickly intervene.

SITE REVIEW: Another significant treatment verification procedure consisted of a site review which was conducted on April 10, 1987. The purpose of this review was to collect information about the nature and quality of early intervention services that are being delivered, to verify that the research being collected by EIRI is being implemented as intended, and to collect needs assessment data which may be useful to site administrators seeking technical assistance.

This review was conducted by the EIRI site coordinator, a staff member from the Des Moines Public Schools, and a parent whose handicapped preschooler was participating as a subject. The site review included a review of the cumulative folders of six subjects, direct classroom observations, interviews with three teachers, and interviews with three parents.

Based on the data obtained during the site review, it appears that the program at the Des Moines Public Schools is providing appropriate, high quality services to children and parents who are participating in the EIRI research project. For example, appropriate assessment procedures were carried out for each child admitted to the program, IEPs and related lesson plans were being implemented as designed. Data collection used to make instructional discussions was occurring, staff typically encouraged developmentally appropriate independent behavior in children. Appropriate prosocial behaviors in children were being encouraged on a regular basis, materials and equipment necessary to carry out instructional activities were present in the classrooms, functional skill training routines were being included in daily classroom activities, personnel evaluations were regularly conducted and appropriately qualified staff were available in sufficient numbers to implement educational activities. No discrepancies between what the research design called for and what was observed were found and the only notable difference between the experimental and control group was that the experimental group was receiving parent training and support.

DATA COLLECTION: It is important to note that the data collected for this study are being collected to assess the effects of intervention not only on the children, but also on their families. A pretest-posttest format was used in this study.

Pretest: Parents of each child participating in the study complete an informed consent form and provide demographic information. In the first of two pretesting sessions, children were administered the Battelle Developmental Inventory (BDI). The BDIs were administered by trained examiners who were unaware of the child's group assignment. Testing occurred at each child's respective school. In a second pretesting session, which took place within two weeks of the BDI test session, parents (usually the mother) completed the following family measures: the Parenting Stress Index, Family Support Scale, Family Resource Scale, Family Inventory of Life Events and Changes, and the Family Adaptability and Cohesion Evaluation Scales. Parents were paid a $20 incentive after both pretesting sessions were completed. (Married mothers and those with spouse equivalents were also given a copy of the Family Support Scale to take home for their husbands to complete.)

Posttest: Posttesting occurred at the end of the school year during the last 2 weeks of May and the first week of June, or approximately 7.5 months after pretesting occurred. The posttest battery took three test sessions to administer. The posttest battery consisted of the same battery of tests and surveys as the pretest battery as well as some additional measures. For mothers the additional tests and surveys include the Peabody Picture Vocabulary Test (PPVT), the CESD Depression Scale, a survey of child health, a Child Improvement (Locus of Control) Questionnaire, and a test of knowledge regarding the PIE training; for children the additional test included the Stanford Binet Test of Intelligence (form L-M). The posttest BDI, Stanford-Binet, and PPVT were administered by trained test examiners who are ignorant of subjects' group assignments. Parents were paid a $40 incentive for completing the posttest battery.

Assessment Management: The BDI examiners were four doctoral candidates in the School Psychology program at Iowa State University. Their training included an extensive inservice on BDI administration and scoring, and each examiner, after administering a minimum of three practice BDIs, were required to pass a quality-control test administration before they were permitted to pretest. Further, each examiner was "shadow scored" at least once during pretesting by the Des Moines site liaison (who is a Ph.D-level school psychologist), and each examiner was videotaped once during pretesting so that their administration could be viewed and corrected, if necessary, by the EIRI assessment coordinator. Interrater reliability data reveal an average coefficient of .91. None of the examiners had any other involvement with the Des Moines program, so the likelihood of their knowing to which group a child was assigned was remote.

All Stanford-Binets were administered by three trained doctoral candidates in the Psychology program from Utah State University. All Stanford-Binet examiners were uninformed about the subjects' group assignments. None of the Stanford-Binet examiners had any other involvement with EIRI or the Des Moines Public Schools, so the likelihood of their knowing group assignments was also remote. All family survey measures were administered to the parents in groups by the Des Moines site liaison. Parents were not allowed to discuss their surveys prior to or during these sessions.

DATA ANALYSIS: Results of posttest data analysis are presented in Table 3.32. Battelle pretest data (one each domain) were the best predictors of BDI posttest scores, with correlations ranging between .74 and .94. All were statistically significant at the $p \leq .001$ level. The pretest BDI total raw score was used as a covariate in a MANCOVA, with treatment group (parent training vs. non-parent training) as the independent variable, and BDI posttest raw scores as dependent variables. Two subscales were found to be significantly different at the $p \leq .01$ level--gross motor and motor total. Both differences were in favor of the non-parent involvement group.

A comparison of family measures for the two groups found statistically significant differences for the Family Support Scale Total (mother), the Family Resources Scale (mother), and the FILE total score. These differences were in favor of the non-parent involvement group for the Family Resources Scale and for the parent involvement group for the Family Support Scale Total and the FILE Total Score. Thus, while the non-parent involvement group reports higher resources (such as time, food, money, etc.), the parent involvement group mothers report higher support from other people and greater life change. While it is possible that the treatment (i.e., being involved in a parent training program) makes the parent either perceive or experience more supportiveness and life change, it is necessary that this finding be replicated in order to clearly ascertain that this is the case.

While the idea of parent involvement in the child's education (using parents as intervenors) has great intrinsic support, these data suggest that this particular type of program, when added to an existing high-quality center-based program, does not substantially affect the developmental progress of children as measured by the Battelle. Since Gatling and White (1987) found this type of program to be representative of 85% of the parent involvement programs being utilized, it would appear that this finding, if replicated, should stimulate new thinking concerning the

Table 3.32

Comparisons of Parent Involvement and Non-Parent Involvement Groups - Des Moines

Variable	Parent Involvement			Non-Parent Involvement				
	N	Adjusted Mean	SD	N	Adjusted Mean	SD	P	ES
BDI								
Total Raw Score	26	400.50	105.48	30	405.24	79.50	.593	-.051
Personal-Social Raw Score	26	115.39	26.35	30	116.01	21.61	.879	-.026
Adaptive Behavior Raw Score	26	72.14	20.87	30	72.71	15.49	.839	-.031
Gross Motor Raw Score	26	61.79	16.03	30	65.93	11.76	.082*	-.298
Fine Motor Raw Score	26	44.04	14.04	30	45.70	10.75	.349	-.134
Motor Total Raw Score	26	105.83	28.65	30	111.63	21.39	.100*	-.231
Receptive Communication Raw Score	26	24.48	8.32	30	23.85	7.15	.628	.081
Expressive Communication Raw Score	26	32.08	13.18	30	32.97	9.90	.212	-.077
Communication Total Raw Score	26	58.14	20.70	30	55.23	15.68	.263	.160
Cognitive Total Raw Score	26	47.31	18.04	30	53.90	18.81	.620	-.358
Parent Stress Index Total (mother)	26	29.28	132.79	30	128.42	23.86	.203	.164
Parent Stress Index Total (children)	26	114.59	15.42	30	116.32	21.13	.607	-.095
Family Support Scale Total (mother)	26	29.78	8.68	28	25.23	8.95	.066*	.516
Family Resources Scale Total (mother)	23	110.31	23.08	25	120.79	18.78	.086*	-.501
FACES Raw Score - Perceived (mother)	25	60.09	7.68	30	60.35	9.80	.915	-.030
FACES Raw Score - Ideal (mother)	22	72.19	6.31	24	71.12	9.24	.689	.138
FILE Total Score	26	10.68	6.57	27	7.19	5.62	.048**	.573

* $p < .1$
** $p < .05$

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and Adaptability scores indicate greater amounts of these factors.

role of parent as intervenor in the child's education.

FUTURE PLANS. Subjects who were assigned to the parent training group during the first year and who remain in the Des Moines Schools preschool program during the second year (approximate n = 14) will continue to receive additional parent training. This training will be facilitated by Des Moines preschool staff. However, based on a parent and family needs assessment administered at the beginning of the training sessions, the training content will be largely parent-determined. In other words, given the following topic areas, parents will determine how much time to focus on each: stress reduction, improving communication skills, dealing with attitudes and feelings surrounding a handicapped child, accessing community resources, legal issues and rights, communication with professionals, accessing (emotional) support, siblings of handicapped children, father's involvement with the handicapped child, playing and recreation. In addition, the PIE materials will be briefly reviewed and parents will be able to receive assistance in implementing home instructional programs with their children.

Training will continue to focus on empowering parents to procure the support and resources they need to function more effectively as a family unit. Parents will determine a much larger proportion of each session's agenda, and they will be encouraged to take a greater role in leading sessions. The continued parent training is designed to emphasize the social support aspects of the intervention, while still maintaining the "parents-as-teachers" aspects of it. Cost data will continue to be collected and analyzed.

DEVELOPMENTAL DISABILITIES, INCORPORATED
Project #14 (Program Variation)

COMPARISON: Moderately to Severely Handicapped Children--Center-based intervention plus parent training versus center-based intervention only

LOCAL CONTACT PERSON: Leon Soderquist, Director, Developmental Disabilities, Inc.

EIRI COORDINATOR: Jim Pezzino

LOCATION: Salt Lake City, Utah

DATE OF REPORT: 9-9-87

RATIONALE FOR THE STUDY: While parents are often involved in their handicapped child's programming prior to age 3, there is a real tendency to exclude parents as the child grows older. The recent passage of PL 99-457, with its specific mention of individual family plans, is an obvious attempt to address the need for more meaningful involvement for the families of young handicapped children. Unfortunately, the research available to date does not provide sufficient direction to those who will be responsible for developing and implementing effective family plans.

This study investigates the immediate and long-term effects of a parent training program which is primarily designed to improve parent's skills as teachers of their handicapped child. Secondly, it provides parents with a forum which allows them to form liaisons and seek support from other parents with handicapped preschoolers. In addition to assessing the impact of this parent training with child progress measures, this study also assessed the possible changes that this training had on the family. The work of several investigators have suggested a linkage between child management skills and family functioning (e.g., Koegel, Schreibman, Britten, Burke, & O'Neil, 1982; Patterson, 1980; Patterson & Fleishman, 1979; Wahler, Leske, & Rogers, 1979); however, additional research is needed to determine the type, consistency, and strength of these effects. Additionally, most previous studies were conducted with children who were categorized as disruptive or oppositional; moderately and severely handicapped children may present sufficiently different problems so that the relationship between behavioral parent training and overall family functioning may not be present or at least may be different.

Similar to Project #13, which was described in the preceding section, this study is being conducted in order to investigate the effects of increased parental involvement on young handicapped children's developmental and behavioral progress and on the family system themselves. Those studies provide a systematic and concurrent replication of each other. While similarities between the two studies are clear (such as sampling, curriculum, parent training procedures, intervention intensity, type of handicapping conditions represented), it is important to note several differences. Although both studies incorporate a similar type and amount of behavioral parent training, the Des Moines study is more emphatic. Also, the DDI study is taking place through a private non-profit agency which contracts with the State of Utah, while the Des Moines study is being conducted at a public school.

Another, less immediately obvious, difference between this study and Project #13 is the age of the handicapped children. Although there is significant overlap in ages, the children serving as subjects in this study are, on the average, one year younger than the subjects in Project #13. This distribution of subject ages across the two studies will allow a broader, more general interpretation of findings.

The basic rationale for conducting these two studies is, of course, similar, and both were guided by some of the same basic questions.

1. What are the immediate and long-term effects of parent training on the young handicapped child and on the family system?
2. What is the relationship between child characteristics, family characteristics, and parent training?
3. Is the magnitude of the effect associated with degree of parental participation?
4. What are the costs associated with additional parent training?

PROGRAM ORGANIZATION: Subjects participating in this study are served through Developmental Disabilities Incorporated (DDI), a community-based private non-profit agency which contracts with the State of Utah, through the Division of Services for the Handicapped, to provide services to handicapped preschoolers and their families. DDI serves over 200 handicapped preschoolers and infants ages 0 - 5 years. (The State of Utah does not mandate educational services for handicapped preschoolers through their education system; rather, services are provided via contracts to third parties through the Division of Social Services and the Division of Health.)

Similar to the Des Moines study, children's programs at DDI are developed based on comprehensive, individual assessments conducted by multidisciplinary teams. Parents are required to participate in the development of Individual Education Plans and are encouraged to become involved in their child's educational program. Unlike Des Moines, transportation services are not provided, nor is there a clear transition process identified for children when they reach school age.

Subjects in the DDI study are all served at one center location; however, the teachers and support personnel who directly intervene with the children are only minimally involved with the parent training treatment and the research effort per se.

SUBJECTS: Fifty-six children are currently enrolled in the project. Their ages at time of enrollment ranged from between 23 to 61 months (mean = 41.95 SD = 10.50). Subject recruitment for this cohort of subjects (originally, 58 subjects were recruited) was completed in late November of 1986. Over 90% of the children are Caucasian and represent most middle and lower middle SES families.

Descriptive and pretest data for the 56 subjects who are currently enrolled in the study are presented in Tables 3.33 and 3.34. Preliminary analysis of these data indicate good cause for assuming lack of systematic bias in the selection of program groups due to sampling error. P-values ranged from 0.995 to 0.300 (two-tailed tests) for t-tests of group comparisons for the variables in question.

Table 3.33

Group Comparisons of Demographic and Mother Stress Data

Variable	Non-Parent Training Group			Parent Training Group			
	mean	*SD*	*n*	*mean*	*SD*	*n*	*P*
Age in months at BDI Pretest	43.15	10.67	27	40.83	10.39	29	.210
Mother's Age	33.82	6.06	27	32.08	5.66	28	.328
Parenting Stress Index Total Score (Mother)	255.85	49.05	27	251.89	34.44	27	.733
Mother's Education	13.74	1.81	27	13.29	2.39	28	.420

Table 3.34

Group Comparisons of Pretest BDI Raw Scores and Pretest Family Measures

Variable	Non-Parent Training Group			Parent Training Group			
	mean	SD	n	mean	SD	n	P
BDI							
Personal Social	88.19	26.62	27	83.59	31.41	29	.556
Adaptive Behavior	55.07	14.04	27	55.41	16.43	29	.934
Gross Motor	44.44	14.35	27	44.69	16.63	29	.953
Fine Motor	28.11	9.48	27	30.66	10.33	29	.341
Motor Total	72.56	22.35	27	75.34	23.93	29	.654
Receptive Communication	16.48	4.99	27	17.14	6.19	29	.663
Expressive Communication	22.11	9.80	27	21.79	9.56	29	.903
Communication Total	38.56	13.99	27	39.03	15.11	29	.902
Cognitive	30.70	9.14	27	31.55	12.60	29	.773
Battelle Total Score	285.07	73.18	27	284.93	85.58	29	.995
Family Measures							
Family Support Scale Total Score (Mother)	27.04	11.13	25	30.04	9.32	27	.300
Family Resource Scale Total Score (Mother)	112.37	18.53	27	114.59	18.45	27	.661
FACES III Discrepancy Total Score (Mother)	13.81	8.56	27	12.93	9.18	29	.711
FACES III Cohesion	37.96	8.25	27	39.72	4.23	29	.326
FACES III Adaptability	24.70	5.92	27	24.62	5.52	29	.957
FILE Total Score Past 12 Months (Mother)	11.74	7.00	27	11.82	5.89	28	.963

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and adaptability scores indicate greater amounts of these factors.

Criteria for Inclusion: Children and their families who were participating in classes, taught by any one of six teachers through DDI's services for handicapped preschoolers, were considered for inclusion in the study. From this pool, subjects were included in the study based on parents' willingness to participate prior to knowing their treatment group they would be assignment.

Assignment to Groups: Subjects who met the criteria for inclusion were randomly assigned to one of two treatment groups. Prior to the initiation of treatment, parents were either assigned to a group in which they received additional training or to a group in which parents received no additional training. The group not receiving additional parent training continued to receive the same level of training that was previously available through DDI's program for handicapped preschoolers.

In order to ensure the comparability of groups, subjects were assigned to groups randomly after being stratified as follows. Within each of the teachers' classes, subjects were categorized according to chronological age (22-34 months, 35-47 months, and over 48 months) and level of parent motivation as perceived by each child's teacher. Categorizing subjects in this way resulted in subjects falling into one of six possible mutually exclusive categories. Within each of the six categories, subjects were rank ordered from low to high based on their DQ test scores obtained from a number of assessment instruments previously administered as part of the eligibility process for receiving services at DDI.

After subjects were categorized, they were alternately assigned to one of the two conditions. Group determination of the first-listed subject (the subject with the lowest DQ score), in each age x motivation category was accomplished randomly. Additional subjects within the same category were then alternately assigned to groups.

Subject Attrition: Two subjects have dropped from the study to date; thus, 56 subjects are currently participating and have been posttested during June 1987. The two subjects who have dropped from the study were both assigned to the non-parent training (or control) group. One of these subjects cited the birth of a new baby and a language barrier (the subject was a recent immigrant) as the reasons for dropping out of the study and out of services altogether. The other subject dropped out of the study because the mother decided to withdraw her child from services at DDI; no other explanation was given. Descriptive and pretest data for the 56 subjects who are currently enrolled in the study are presented in Tables 3.33 and 3.34.

INTERVENTIONS: The purpose of this study is to compare center-based intervention plus parent training with the effects of center-based intervention alone. A description of these two treatments follows:

Center-Based Only: Children in this program attend an existing center-based 1/2 day, 5-day-per-week intervention program in which they receive small group and individualized teaching sessions from special education teachers and paraprofessional aides. Teachers have teaching degrees, but do not have certifications for preschool handicapped. Paraprofessionals are non-degreed, with varying amounts of experience. Each class of approximately 10 children has one teacher and one aide. Because each child's progress is "IEP driven," motor and speech therapists' contacts with children vary widely. In general, a motor and speech therapist is present in each class for the equivalent of 1 day per week. During a typical day, children are instructed in the motor, speech and language, self-help, cognitive, and social skills areas. As part of the regular services to children, parents are involved in IEP meetings, and teachers occasionally visit with parents at school to discuss the progress of their children. No single specific commercial curriculum is used in determining intervention goals and activities. Instructional activities are developed from the comprehensive assessments and items drawn from a number of curricula. Language and motor therapists provide individualized motor and speech and language instruction to the children, and assist teachers and aides with the implementation of these activities.

Center-Based Plus Parent Training: In addition to the basic center-based service described above, children in the experimental treatment group (parent training group) receive an intensive parent training intervention. The parent training intervention is based on the Parents Involved in Education (PIE) training package (Pezzino & Lauritzen, 1986). These PIE training modules are taught by the DDI social worker and the Director of DDI, and are designed to provide parents with a systematic conceptual and hands-on experience in such areas as child development, observation and recording, targeting intervention behaviors, teaching processes, decision making, and communicating with professionals. The training format consists of small-group lecture, discussion, and demonstrations. The average small group size is between 8 and 12 parents. Training sessions consist of approximately 15, 2-hour sessions, roughly 1 per week excluding school holidays. Training sessions also include a social support component in which parents have the opportunity to share feelings and express problems, challenges, and other issues associated with their lives. In addition to these sessions, parents are asked to practice the parent intervention training at home with their children. They are asked to choose a target behavior for the child (such as buttoning), implement a short training session (about 15 minutes, 3-5 times per week), and measure progress by comparing baseline data with data collected after the intervention.

TREATMENT VERIFICATION: A number of procedures have been implemented in order to provide an independent verification of the specifics of the intervention program using a structured evaluation guide and identify areas where technical assistance would be beneficial. Child attendance data for basic services and parent attendance data for parent training sessions were recorded throughout the year. Child attendance was recorded daily, and parent attendance data (for the parent training group) was recorded weekly; these data were sent to EIRI on a monthly basis. A cursory viewing of the attendance data for this study shows no obvious differences in attendance for the children in the non-parent training group versus the parent training group. Parent attendance data would seem to indicate that attendance exceeding 75% was typical.

A description of quality of parent involvement was also gathered annually by a direct intervenor who worked most closely with the respective parent. The data obtained was the intervenor's perception (low, average, high) of how a parent rated on attendance, knowledge, and support. Based on our experience, most direct intervenors feel confident that they can accurately identify parents who are motivated and engage in a high quality of involvement with the child's intervention program. These data will be used in data analyses and for descriptive purposes. For example, it will be important to know if parents who were described as highly knowledgeable and motivated by intervenors, experienced greater success in implementing parent programs and/or if these programs were more effective than those conducted by other parents. While these analyses remain incomplete at the current time, it appears that most parents in this study display either average or high motivation, with only one or two parents being ranked "low." We feel that this is likely to be typical of a more general population also.

Additionally, parents in the parent training group were asked to submit weekly postcards which indicated the amount of time they spent doing instructional activities with their child. Parents in the non-parent training group were asked to submit postcards for only three separate weeks during the year. Parents in the parent training group were asked to submit data records of the home intervention programs they designed based on their PIE training. Each site summarized these data and sent it to EIRI staff monthly. In order to encourage parents to consistently turn in postcards, EIRI provided a free developmental toy as an incentive for families which turn in 10 postcards consecutively. If parents were late in submitting their weekly postcards, a reminder phone call was made. If they still did not turn them in, we did not ask for them again (we did not want parents to feel badgered regarding this activity). Parent involvement data will provide useful information regarding the effects of various service configurations on how much time parents spent doing intervention-related activities, and it will be useful in assessing the effects of amount of parent time on child progress.

Being able to conduct or statistically control analyses using parent involvement data is obviously useful; however, collecting parent involvement data may have additional positive effects. It may have a motivating effect on parents, and it readily identifies some types of treatment implementation problems which may arise so that service providers can quickly intervene. Analysis of parent involvement data remains incomplete at the present time.

SITE REVIEW: Another significant treatment verification procedure consisted of a site review which was conducted on June 4, 1987. The purpose of this review was to collect information about the nature and quality of early intervention services being delivered, to verify that the research collected by EIRI is implemented as intended, and to collect needs assessment data which may be useful to site administrators seeking technical assistance.

This review was conducted by the EIRI Site Coordinator, the director of DDI, and a parent whose handicapped preschooler was participating as a subject. The site review included a review of the cumulative folders of six subjects, direct classroom observations, interviews with three teachers, and interviews with three parents.

Based on the data obtained through the site review, it appears that the program at DDI is providing appropriate, high quality services to children and parents who are participating in the EIRI research project. No discrepancies between what the research design called for and what was observed were found and the only notable difference between the experimental and control group was that the experimental group received the parent training and support.

The one serious area of concern which is not currently being adequately addressed is transition. It is not apparent that the problem lies solely or even primarily with DDI, rather, this is a situation which involves several agencies, some of which are undergoing significant changes. It is recommended that the improvement of transition be considered a priority in upcoming coordination activities with school districts and agencies. Transition models which may be useful to DDI are available and may be reviewed prior to the start of services next year.

DATA COLLECTION: It is important to note that the data collected for this study are being collected to assess the effects of intervention not only on the children, but also on their families. A pretest-posttest format was used in this study.

Pretest: Parents of each child participating in the study complete an informed consent form and provided demographic information. In the first of two pretesting sessions, children were administered the Battelle Developmental Inventory (BDI). The BDIs were administered by a trained examiner who was unaware of the child's group assignment. Testing occurred at the DDI center. In a second pretesting session, which usually took place within two weeks of the BDI test session, parents (usually the mother) completed the following family measures: the Parenting Stress Index, Family Support Scale, Family Resource Scale, Family Inventory of Life Events and Changes, and the Family Adaptability and Cohesion Evaluation Scales. Parents were paid a $20 incentive after both pretesting sessions were completed. Married mothers and those with spouse equivalents were also given a copy of the Family Support Scale to take home for their husbands to complete.

Posttest: Posttesting occurred at the end of the school year during the last 2 weeks of May and the first week of June, or approximately 7.5 months after pretesting occurred. The posttest battery took three test sessions to administer. The posttest battery consisted of the same battery of tests and surveys as the pretest battery as well as some additional measures. For mothers the additional tests and surveys include the Peabody Picture Vocabulary Test (PPVT), the CESD Depression Scale, a survey of child health, a Child Improvement (Locus of Control) Questionnaire, and a test of knowledge regarding the PIE training; for children the additional test included the MCDI. The posttest BDI and PPVT were administered by trained test examiners who were ignorant of subjects' group assignments. Parents were paid a $40 incentive for completing the posttest battery.

Assessment Management: Four local test examiners were trained to administer the pretest and posttest BDIs. All BDI test examiners were doctoral candidates in the psychology program from Utah State University or master's level staff from the Developmental Center for Handicapped Persons at Utah State University. Testing was scheduled directly with the examiners by the site liaison at the DDI. Shadow scoring of 10% of the BDI test administrations was conducted by a staff person from EIRI or by having two of the examiners score the same protocol at the same time. All BDI examiners were uninformed about the subjects' group assignments. Their training included an extensive inservice on BDI administration and scoring, and each examiner, after administering a minimum of three practice BDIs, were required to pass a quality-control test administration before they were permitted to pretest. Interrater reliability data reveal an average coefficient of .94. All family survey measures were administered to the parents in groups by EIRI staff who were also ignorant of subjects' group assignments. Parents were not allowed to discuss their surveys prior to or during these sessions.

DATA ANALYSIS: The results of the analysis of the posttest data are presented in Table 3.35. Battelle pretest data (in each domain) were the best predictors of Battelle posttest scores, with correlations ranging between .78 and .93. All were statistically significant at the $p \leq .001$ level. The pretest Battelle total raw score was then used as a covariate in a MANCOVA, with treatment group (parent Insert

Table 3.35

ANOVAS Comparing Parent Involvement and Non-Parent Involvement Groups - DDI

Variable	Parent Involvement			Non-Parent Involvement				
	N	Adjusted Mean	SD	N	Adjusted Mean	SD	P	ES
BDI								
Total Raw Score	29	322.29	92.92	26	304.38	82.90	.074 *	.204
Personal-Social Raw Score	29	96.72	30.81	26	87.62	27.22	.091 *	.313
Adaptive Behavior Raw Score	29	60.97	17.23	26	57.92	15.23	.290	.188
Gross Motor Raw Score	29	49.13	19.07	26	47.95	14.60	.765	.070
Fine Motor Raw Score	29	33.36	10.75	26	31.85	9.78	.411	.147
Motor Total Raw Score	29	82.49	28.01	26	79.81	22.54	.607	.106
Receptive Communication Raw Score	29	19.35	8.68	26	18.79	6.82	.663	.072
Expressive Communication Raw Score	29	25.83	11.26	26	25.98	11.02	.937	-.013
Communication Total Raw Score	29	45.18	19.12	26	44.73	16.82	.875	.025
Cognitive Total Raw Score	29	37.49	15.81	26	34.58	13.87	.195	.196
Parent Stress Index Total (mother)	27	136.66	21.23	26	138.17	28.07	.737	-.063
Parent Stress Index Total (children)	27	122.00	16.78	26	121.32	22.63	.884	.035
Family Support Scale Total (mother)	27	30.46	10.09	24	27.93	11.17	.326	.238
Family Resources Scale Total (mother)	27	112.04	18.75	26	112.19	24.45	.783	-.007
FACES Raw Score - Perceived (mother)	29	64.94	6.02	26	62.86	8.59	.254	.285
FACES Raw Score - Ideal (mother)	29	77.80	7.02	26	75.20	10.71	.210	.293
FILE Total Score	28	11.98	6.69	26	10.94	7.29	.460	.149

* $p < .1$

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and Adaptability scores indicate greater amounts of these factors.

training vs. non-parent training) as the independent variable , and Battelle posttest raw scores as the dependent variables. One subscale was found to be significantly different in that the personal-social scores were higher for children whose parents had been involved in parent training ($p < .091$). The Battelle total raw score was also significantly higher for the same group of children ($p \leq .074$). No other statistically significant differences were found either for the Battelle subscores or for the family measures.

Ideally, greater parental involvement with the child should lead to growth in the child, which would be indicated by higher Battelle scores. This study provides some tentative indication that this may be the case. However, the discrepancy in findings between the Des Moines and DDI sites points to the need for further analysis. The results presented here are preliminary; more work needs to be done in order to clearly specify the interrelationships of variables that may affect the parent's role as intervenor in the child's education.

FUTURE PLANS. Subjects who were assigned to the parent training group during Year 1 and who remain at DDI during Year 2 (approximate n = 13) will continue to receive additional parent training. This training will be facilitated by DDI preschool staff; however, the training will be based on a parent and family needs assessment administered at the beginning of the training sessions. The training content will be largely parent-determined. In other words, given the following topic areas, parents will determine how much time to focus on each: stress reduction, improving communication skills, dealing with attitudes and feelings surrounding a handicapped child, accessing community resources, legal issues and rights, communication with professionals, accessing (emotional) support, siblings of handicapped children, father's involvement with the handicapped child, playing and recreation. In addition, the PIE materials will be briefly reviewed and parents will be able to receive assistance in implementing home instructional programs with their children.

Subjects who were assigned to the non-parent training group during year 1, regardless of whether they remain in the DDI program or not, will be posttested at the end of Year 2. Cost data will continue to be collected and analyzed.

ASSOCIATION FOR CHILDREN WITH DOWN SYNDROME (ACDS)
Project #15 (Program Variation)

COMPARISON: Children with Down Syndrome -- center-based program versus center based program plus Parental Involvement (Individualized Parent Training)

LOCAL CONTACT PERSON: Fredda Stimell, Executive Director, Association for Children with Down Syndrome (ACDS)

EIRI COORDINATOR: Carol Tingey

LOCATION: Bellmore, NY (Long Island)

DATE OF REPORT: 9-8-87

RATIONAL FOR THE STUDY: Perhaps the most persistent of the popular issues concerning early intervention is the generally accepted statement that involving parents heavily in the intervention of their children results in more effective intervention services. The initial results of the meta-analysis of the early intervention research literature reported by White and Casto (1985) were somewhat startling concerning the area of parental involvement. Briefly, the findings suggested that parents could be effective interveners, but that programs which involved parents heavily did not appear to be any more effective than programs which did not (see also Casto & Lewis, 1984). White and Casto (1985) were quick to point out however, that virtually all studies which had investigated the question of parent involvement directly had been done with disadvantaged instead of handicapped children, had had serious methodological flaws, used narrow and often inappropriate outcome measures, and did not verify whether parents in "high involvement" groups actually participated in the program to the degree desired.

The question of parent involvement is complicated by the definition of what the term implies. "Involvement" could range from administrative and fiscal management of program to attendance at a yearly family picnic and include most anything in between. Obviously, of course, parents must be minimally "involved" with any program for infants and young children even if their involvement is largely referral and making sure that the child is in attendance.

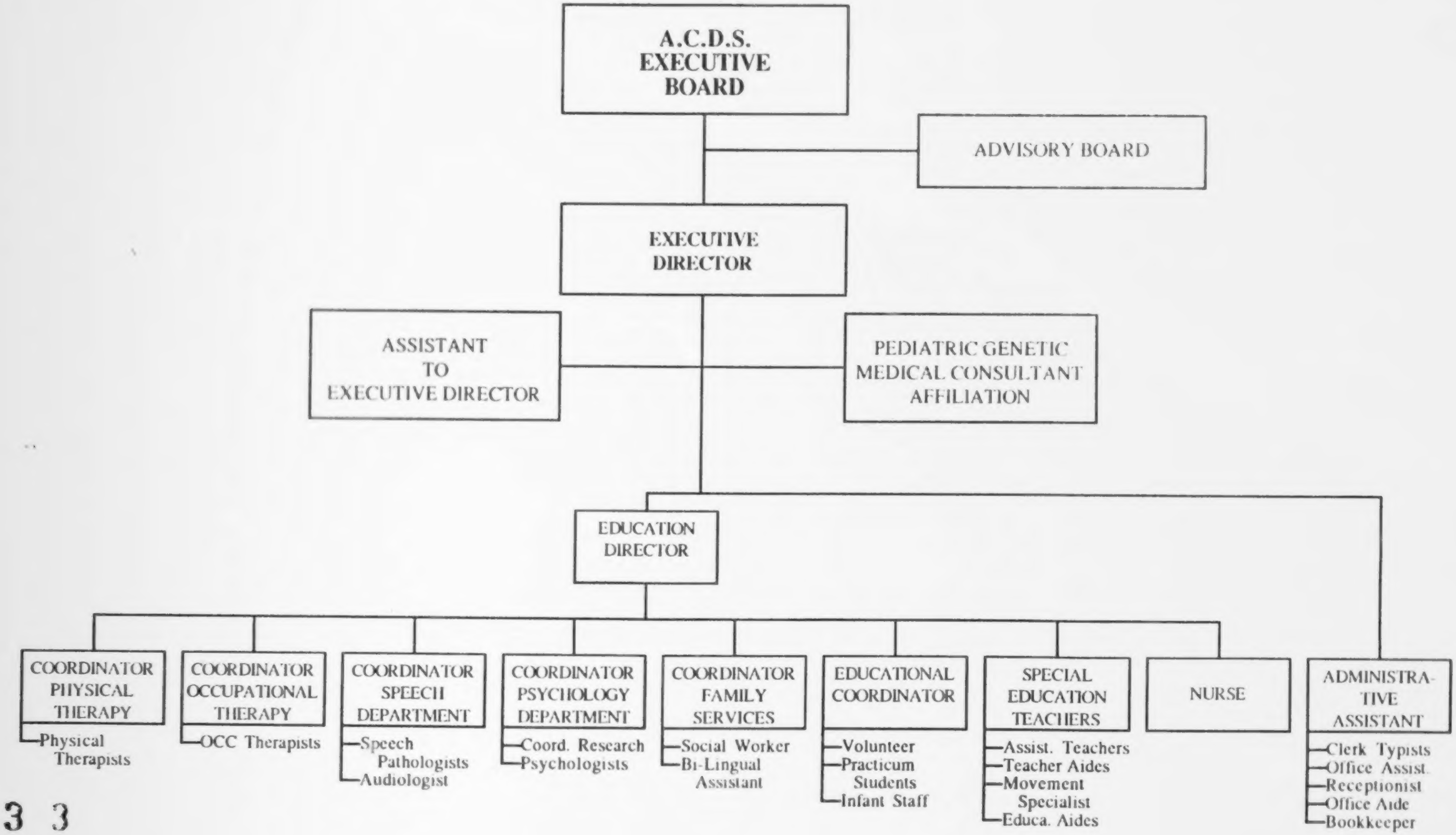
Most of the previous research concerning parental involvement has been concerned with teaching groups of parents to be developmental therapists for their children. This project is designed to investigate the impact of individualized training of procedures to teach specific transdisciplinary goals to parents. The training is implemented by trained psychologists who are concurrently having hands on experience with children who have Down syndrome, including the children whose parents will be trained. Parents in the sample have handicapped children, but are largely free of life stresses typical in homes of disadvantaged children. Understanding the impact of personalized training for these families can identify more clearly issues concerning relevant and effective use of time and energy for parents and for service delivery staff. In summary, the purpose of this project is to investigate the longitudinal costs and effects of a center-based early intervention program for Down syndrome children which has extensive individualized parent involvement, versus the same center-based program without the additional parent training component.

PROGRAM ORGANIZATION: The Association for Children with Down Syndrome (ACDS) preschool program is a privately operated program consisting of several program units directed toward children at various developmental levels. The infant program unit is for children from birth to approximately 14 months of age, while the toddler and preschool program is directed to children from 14 months of age to 5 years of age. At age 5, children are referred to their local public school district's Committee on Special Education for appropriate educational placement (Table 3.36).

Curriculum in the program is based on a Piagetian model of development and assumes that young children with Down syndrome follow the same sequence of development as nonhandicapped children and can show gains in developmental skills. The primary goals of the program are to have each child with Down syndrome working at his/her optimal potential by identifying learning strategies and effective teaching techniques for the individual child in all developmental areas: gross motor, visual-

Table 3.36

Organizational Structure for Association for Children with Down Syndrome - New York


A.C.D.S. EXECUTIVE BOARD
ADVISORY BOARD
EXECUTIVE DIRECTOR
ASSISTANT TO EXECUTIVE DIRECTOR
PEDIATRIC GENETIC MEDICAL CONSULTANT AFFILIATION
EDUCATION DIRECTOR
COORDINATOR PHYSICAL THERAPY
Physical Therapists
COORDINATOR OCCUPATIONAL THERAPY
OCC Therapists
COORDINATOR SPEECH DEPARTMENT
Speech Pathologists
Audiologist
COORDINATOR PSYCHOLOGY DEPARTMENT
Coord. Research
Psychologists
COORDINATOR FAMILY SERVICES
Social Worker
Bi-Lingual Assistant
EDUCATIONAL COORDINATOR
Volunteer
Practicum Students
Infant Staff
SPECIAL EDUCATION TEACHERS
Assist. Teachers
Teacher Aides
Movement Specialist
Educa. Aides
NURSE
ADMINISTRATIVE ASSISTANT
Clerk Typists
Office Assist.
Receptionist
Office Aide
Bookkeeper

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fine motor, communication (receptive and expressive), self-help (feeding, dressing, grooming, and toileting), socialization (awareness of self, adaptation to environment, adaptive behavior, play skills) and cognitive (object permanence, generalization, and concept development).

An underlying assumption of the program is that interventions should be implemented using principles of behavioral psychology and reinforcement. Behavioral interventions are based upon the applied analysis of behavior, are habilitative, prescriptive, and emphasize positive reinforcements that can occur ecologically. The goal is to promote developmentally appropriate and socially accepted patterns of adaptive behavior.

ACDS utilizes a transdisciplinary approach to the early intervention program including a team consisting of special education teachers, assistant teachers, speech/language pathologists, social workers, psychologists, physical therapists, occupational therapists, nurse, movement and music specialist, volunteers, students and a consulting pediatrician-geneticist. The teacher acts as the team facilitator integrating the expertise of the entire team. Team meetings are held to discuss the progress of individual children as well as to develop strategies for programming. Staff also meet with parents on an individual basis.

The Curriculum: The basic curriculum for the center based program utilizes a number of published early childhood education and special education curriculum packages such as Small Wonder, Merle Karnes, Circle Pines; Down Syndrome Performance Inventory, University of Washington; Assessment Battery, (1969), National Institute on Mental Retardation, Shirley Volpe; and Sequenced Curriculum for the Severely and Profoundly Mentally Retarded and Multiply Handicapped, M.E.M. Kissinger, (1981), Springfield: Chas. Thomas Publisher. A typical day includes sensory integration, small and large group instruction (in all areas of development), individual task time, and free exploratory play activities. Throughout the day a range of therapeutic services are implemented for goals such as: eye to eye gaze, orientation to name, attending skills, as well as other adaptive behaviors. As children get older, activities are planned to emphasize independence and functional skills in order to prepare children for integration into the least restrictive environments. Data collected from children's IEPs, formalized assessments, informal behavioral observation and standardized checklists, are used for program evaluation.

Personnel: Services are provided by a multidisciplinary staff of 75 people. Each child is provided services by a transdisciplinary team which has been assigned to that child. The way in which staff is incorporated into the program is described below.

Teachers/Assistant Teachers are the primary facilitators of the team. M. S. level special educators are responsible for knowing each child's IEP which has been designed with each team member's input. They systematically implement and evaluate the child's program. Parents are scheduled to observe and participate at the school a minimum of once per month during which time they learn about the child's needs and give input on IEPs. Parents are also invited to attend (monthly) workshops given by staff in areas such as behavior management, toilet training, speech and language, and gross and fine motor development. Parents also receive a yearly home visit by the teacher and other specialists as appropriate. Assistant teachers are usually also certified teachers who receive inservice training in order to facilitate all aspects of prescribed programming.

Social Workers interface with teachers to develop strategies for working with individual families and facilitate a parent-professional relationship. Social workers provide group and individual counseling, information and referral services, and function as members of the transdisciplinary teams.

Psychologists provide child assessment (formal and informal) and parental counseling and training. Formal assessments include determining developmental levels, social adaptation skills, generalization abilities, self-help skills, and IQ score for the older children. Parental training emphasizes behavioral management skills and includes lectures, one-to-one counseling modeling demonstration, suggested readings, parent groups with classroom, home and hypothetical situations discussed among parents and psychologists.

Registered Nurses care for youngsters who do not feel well, and act as a resource to keep parents and staff up-to-date on health and safety issues. The nurse also participate in the education of community health professionals concerning the child with Down syndrome.

Speech Pathologists provide the children at ACDS with an intensive speech and language therapy program both on an individual and group basis to minimize the severe delay in the area of language development and speech most children with Down syndrome exhibit. Beginning in the infant program, the speech pathologist's program is two-fold: first, to emphasize adequate development of the oral muscles used in feeding and speech articulation, and, second, to develop receptive and expressive language to enhance communicative function. Signing is incorporated into a total communication approach to facilitate expressive language and to minimize the child's frustration. Tympanometric screening and pure tone audiometric screening is given to toddlers and preschoolers to determine if a hearing loss could be interfering with speech and language development.

Physical Therapists follow a neurodevelopmental and sensory integration approach where each child is brought through the stages of development using the prior stage's components as a building block for the next stage. The physical therapist evaluates how a child's individual degree of low muscle tone affects the child's gross motor development, posture, mobility and functional skills. The quality of movement and balance reactions are emphasized. Direct services are given to children individually and in groups. Parents are instructed in proper handling and positioning techniques and encouraged to work with their child at home.

Occupational Therapists at ACDS work within the child's occupation (i.e., play), by evaluating and developing a course of therapy to enhance sensory, gross and fine motor, activities of daily living and behavioral and perceptual skills. The occupational therapist strives for each child's normalization of all sensory systems (tactile, vestibular, kinesthetic, visual and auditory) providing the foundation for the development of specific skills, which can be as basic as exploring and reaching for objects or as complex as writing one's own name. Parents are made aware of the child's program.

The Movement and Dance Specialist works with children from their earliest months at ACDS. Music, which is stimulating and expressive, motivates each child to learn and to use his/her body coordination. Children are taught to be expressive by swaying to music, clapping hands to rhythms or by dancing. The movement specialist works with suggestions from the physical and occupational therapists. The goals of the movement and dance program includes: increasing coordination of fine and gross muscles; assisting children in understanding, identifying and using different part of his or her body; developing communication abilities, listening skills and attention span; and helping each child experience a feeling of accomplishment. The movement and dance specialist works with children 14 months to 5 years each week and with children under 14 months twice per week.

Volunteers (including student and community residents) who come to ACDS from the surrounding communities are trained in specific tasks within the educational program. They are an integral part of the school program and currently provide approximately 150 hours of service per week. ACDS is a training facility for graduate and undergraduate students from universities with specialties in special education, nursing, speech pathology, psychology, child care, etc.

SUBJECTS: There are currently 24 infants and children between 2 months and 5 years enrolled in the pilot phase of the study. Parental consent forms have been signed by an additional 37 families. Additional subjects will be recruited from families who have entered the program since fall 1986. It is anticipated that the enrollment will be 70 when the project begins in September, 1987. Descriptive data of children presently assigned to groups is given in Table 3.37.

Criteria for Inclusion: All children participating in the study have Down syndrome. The project serves families in Suffox and Nassau Counties. A few children from surrounding counties on Long Island are served through interagency agreement. The medical diagnosis of Down syndrome is required for enrollment in the program. Children who have Down syndrome and other complicating conditions (need of additional family support, severe developmental delay, seizures or other medical difficulties) are enrolled in the ACDS "Intensive Classroom," and were not included in the study.

Procedures for Identification and Assignment: Developmental level in months was measured by the child's score on the full Uniform Performance Assessment System (UPAS) which was administered by classroom teachers in the fall of 1986. Names were listed in six groupings by CA of the child. Groups were: 0-13 months; 14-20 months; 21-28 months; 29-36 months; 37-45 months; 46-58 months. In each of the groups names were listed by developmental level in months as measured by the full UPAS. The list also included information concerning sex of the child and whether the child had a heart condition. The first two names on the list were considered a pair, the third and fourth a second pair, and so on through the list. In each of the pairs the first member was assigned a group by the use of a table of random numbers. The other member of the pair was assigned to the other group. The basic services group and the additional services group membership was then compared for sex distribution and for heart condition and found to be approximately the same (62% versus 50% male; 38% versus 34% female with heart defects). Tables 3.37 and 3.38 show the characteristics of the children in each group.

Subject Attrition. No attrition has occurred with those subjects identified to participate in the pilot phase of the study.

Table 3.37

Group Comparison, Subject Data - New York - ACDS

Variable	Expanded Services Group			Basic Services Group		
	n	M	SD	n	M	SD
CA	29	29.72	15.74	29	30.45	15.64
DQ as measured by UPAS	29	58.28	19.03	29	60.45	19.66
Congenital Defect	11			10		
Sex	11F 18M			14F 14M		

Table 3.38

BDI Raw Scores for participants in the New York ACDS pilot project

	Pilot Subjects					
Variable	(Basic Services)			(Expanded Services)		
	mean	(SD)	n*	mean	(SD)	n
Personal Social	61.2	(25.45)	9	81.86	(34.41)	14
Adaptive Behavior	41.44	(12.49)	9	49	(19.46)	14
Gross Motor	36	(16.46)	9	39.14	(18.34)	14
Fine Motor	19.56	(9.13)	9	24.43	(12.05)	14
Motor Total	55	(25.55)	9	63.57	(29.57)	14
Receptive Communication	12	(4.06)	9	13.86	(4.67)	14
Expressive Communication	10.44	(6.8)	9	15.43	(7.61)	14
Communication Total	22.44	(9.08)	9	29.29	(11.78)	14
Cognitive	22.22	(6.61)	9	26.14	(9.03)	14
Battelle Total Score	202.33	(75.84)	9	249.86	(101.25)	14
Chronological Age (months)	30.45	(15.64)	9	29.72	(15.74)	14
DQ as Measured by UPAS	60.45	(19.66)	9	58.28	(19.03)	14

*Information on subjects is obtained at initial referral and then again after pretest. Some data, therefore, are not yet available on all subjects.

INTERVENTION: Children participating in both experimental groups receive the same basic center-based program (which varies depending on their age). The difference between the groups is that those children in the expanded services group receive additional individualized parent involvement activities. The content of both programs is described below.

Basic Service Group: The basic services group consists of the ongoing ACDS center-based program that would have been if operation in the research were not being conducted. This program varies depending on the age of the child as described below.

Infant Classes are held at the school two times per week where parents and infants meet for individual direct service programming with the transdisciplinary team. Individualized programs are developed and implemented during two hours of direct services. At each session, parents receive written suggestions and printed educational materials for them to continue working on at home. Pertinent workshops are presented on a monthly basis which also include Rap sessions for parents. In addition, monthly home visits are made by the infant teachers. Specialists may also accompany an infant teacher on a home visit. The infant program includes children of age 2 months to 18 months. An average day includes:

9:30 - 9:45 Movement

9:45 - 11:30 Direct services, with parents, infants, transdisciplinary team members to individualize sensory stimulation programming

11:30 - 12:30 Parents from morning and afternoon classes meet for Rap with the Family Services Department. During this time the children remain in the infant classroom with the transdisciplinary team and interventions are continued. Afternoon Class - p.m. Parents come to classroom after Rap and follow same schedule as above.

The Toddler and Preschool Classes are held at the school for 3 hours a day 5 days per week. Children are transported via bus or by their parents to the school. Notebooks are used for daily communication between staff and parents. Formal parent-teacher IEP conferences are held a minimum of twice per year. Parents receive a mid-year and year-end developmental report on their child's progress. Individual and group social services to the families are available on an "as needed" basis. Home visits are made by staff members on a regular basis. An open door policy is maintained for the first few weeks of the toddler program or for any child starting school for the first time in a preschool class in order to facilitate the child's adjustment to the classroom. Parents are otherwise requested to schedule visits a minimum of once per month to see appropriate personnel and to participate in the classroom programming and learn techniques which they can carry out at home with their child. Workshops are offered to parents on topics of interest by specialists from ACDS as well as outside professionals. A typical daily schedule for a younger toddler includes:

9:30 - 10:00	Sensory stimulation/free play
10:00 - 10:45	Small group activity. Children are taken from the group for individual work on developmentally appropriate tasks and to receive therapy.
10:45 - 11:00	Large and small group activity as well as painting, shaving cream, rice, water, and other sensory play.
11:00 - 11:30	Gross motor activity. Obstacle course with tunnels chairs, ladders, etc. Also circle time to teach concepts such as in-out, on-off, and to play drums, bells, or sticks. Music to learn name, eye to eye gaze, attending skills/feeding skills.
11:30 - 12:00	Lunch time
12:00 - 12:30	Language circle, learn words and free play while getting ready for bus.

A typical daily schedule for an older toddler includes:

9:30 - 10:00	Exercise gross motor and sensory stimulation
10:00 - 10:45	Individual task and therapist time, small group/free play
10:45 - 11:00	Large and small group, arts and crafts using sensory materials
11:00 - 11:30	Gross motor course, concept circle, teaching songs and name identification.
11:30 - 12:00	Lunch/feeding
12:00 - 12:30	Free play, story, group activities
12:30 -	Dismissal

Process for Selecting Child's Goals. Children in all units are trained on specific individual skills as determined by the following procedures.

- Behavioral observation of child by teacher/OT & PT/speech therapist/psychologist using checklists as guideline.
- Transdisciplinary team meeting to discuss the developmental needs of the child.
- Specific target behavior selected and criteria for acquisition of behavior determined in transdisciplinary team meeting.
- Baseline behavior observed on target behavior by psychologist or trained observer in classroom using General Observation Sheet.
- If work on behavior is appropriate as seen by baseline observation it is discussed with parents.
- Teacher and/or other staff members trained to implement in classroom.

The pool of potential behaviors come from developmental assessments made by physical and occupational therapists, speech therapists, and teachers. Each of these professionals have been using assessment tools that emphasize their particular training expertise. For example, the teachers use the Uniform Performance Assessment System (UPAS). This curriculum-based criterion referenced scale divides developmental skills into: pre-academic, communication, social/self-help, gross motor categories, and includes a specific inappropriate behavior checklist. Items for the UPAS were taken from existing developmental scales.

Professionals trained in disciplines other than teaching use instruments and procedures designed to focus on child developmental status as measured by demonstrated child performance in areas of specific expertise of the discipline. For example, physical therapists assess mobility skills, and occupational therapists assess functional movement patterns. Speech, language, and communication skills are assessed by the speech therapists. Items from all of these child performance assessments have been collected onto approximately 100 pages of checklists that are kept in the child's folder and updated daily. Rather than relying on the memory of those working with the child, the exact number of occurrences of specific behaviors of each child are observed and recorded.

After data from various instruments and clinical assessment is summarized during weekly staff meetings, behaviors that the child is ready to learn are isolated and staff discusses the child's current overall functioning to select the most salient behaviors for that child. Parents give routine written and verbal input on areas of concern to them. These areas are observed and assessed by staff. When all of these measures have been integrated, the situation is discussed with parents and specific training sequences are developed that include the child's most pragmatic needs and the materials and rewards that are most effective with the child.

Although technically any of the over 100 pages of items on the transdisciplinary assessment instruments could be identified as the child's most appropriate and significant learning need, certain skills have regularly been needed by children with Down syndrome served in the program birth to five year age range.

Behavioral training programs have, therefore, been written for some 60 skills. Additional programs may be written if the process described above identifies other skills pertinent to that child's development. Each of these programs is described as a specific sequence with suggestions for rewards and criteria for completion included. Each sequence has an estimated number of minutes to complete. These training programs have been implemented by the staff in the center-based program.

Expanded Services Group: Parents in the expanded group receive exactly the same services as parents in the Basic Services Group except they are also given additional services which are designed to enhance parent's abilities to tutor the child on specified skills. These services are based on individual instruction using videotapes and parent modeling to train identified target behaviors. Those experienced in working with parents have found that although parents may learn to teach one skill effectively, and there may be general understanding of the concept, it is necessary to train parents for each new skill.

The expanded group parents will be trained individually in the use of the procedures to teach the skills needed by the child and asked to work with the child at home. Repeated contact will be made by a licensed psychologist and training will include a monthly 1 hour of face-to-face individual tutorial session, and weekly follow-up telephone calls by the same psychologist. This training will include the procedures to be used and incorporate parental demonstration of the training sequence with the child and criteria for attainment of the skill. Parents will also be given a written copy of the training sequence and a calendar-like chart to keep a record of home training completed. The parent will use the record as a prompt to tell the psychologist during the weekly call of the training activities performed.

Videotapes will be used as part of the training. These tapes show an adult interacting with a child who has Down syndrome, that is being trained for the specific skill or in a skill closely related to the skill to be trained. Ten demonstration videotapes have been made, additional tapes will be created as needed.

Expanded Services group children will be observed in the classroom by a "blind" observer to see if the training has generalized to the classroom setting. When a child reaches criteria on each skill, a new program will be implemented on a new target skill to be trained and will be identified by the ongoing procedures described above. In addition to the more global assessment by norm referenced scales, progress will be measured by the length of time necessary for the child to perform the task to criterion, documented by direct observation. When criteria for that specific behavior are reached, a new behavior is selected.

Optional Services: In addition to the basic program, ACDS provides a variety of additional activities and services for families who choose to participate. Families in either the Basic or Expanded Services group are eligible to participate in these services. Careful records will be maintained about which families participate in the various services available (Table 3.39). Most of these services are provided through the social work/family services department. These include:

Infants - The Social Worker works with the teacher to develop strategies for working with the individual family as well as to help facilitate a parent-professional relationship. The Family Service Department plays a dynamic role in the school program lending its support to families and the transdisciplinary team through group and individual counseling, concrete services, information and referral.

Fathers - A fathers rap group is held each year in the evenings and is led by a certified social worker.

Coffee and Conversations - Group meetings held once per month for all parents to gather information, discuss concerns and bring up relevant issues.

Home Visits - The minimum number is once per year. Families with acute needs receive more home visits on an as needed basis.

STEP - Systematic Training for Effective Parenting (1976 American Guidance Service), a program designed to enhance parenting skills, is offered in a 9 week course.

Table 3.39

Number of Families Participating in Optional Services - New York - ACDS - 1985-86

Events:

Sibling Day -- 33 families

Father's Breakfast -- 25 fathers

Grandparents Day -- 30 families

Requested 1 day per month parent participation in classroom:

10 times (maximum requested)	8 families
9 times	10
8	10
7	8
6	5
5	4
4	3
3	2
2	1
1	5

Siblings - Siblings are invited on a specifically planned day to participate in a shortened school day. A series of sibling Raps are offered to inform siblings about Down syndrome, enable them to meet other siblings of children with Down syndrome and provide siblings with an opportunity to express concerns and feelings.

Share - A group meeting held once per month for the parents of students graduating from ACDS. This is designed to help prepare parents to separate from ACDS, familiarize themselves with the child's needs, become advocates for their children and to understand the Committee on Special Education.

Peer Counseling - Peer counselors are parents of children with Down syndrome who have received systematic training through the Family Services Department to advise, counsel and provide support and information to new parents. Peer counselors are available to go to the hospital or the home when new babies with Down syndrome are born. Peer counseling is designed to be short-termed and self-limited.

General Support Services - The social workers serve as liaison between the transdisciplinary team and parents. They offer referrals, resources, and concrete services such as: referral to social services, public assistance, food stamps, daycare, etc. as well as providing direct care information for out of state families and agencies. Conferences, relating to issues concerning children with Down syndrome and their families, are attended. A systematic information data base on all other related services and agencies has been established and maintained. This year, the services of a bi-lingual worker are available for hispanic families enrolled in ACDS.

TREATMENT VERIFICATION: A number of procedures are being implemented in order to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data. The child's attendance in the regular program is recorded. The parent's attendance at training sessions is recorded. Reasons for any extended absences are recorded.

2. Parent Report of Tutoring at Home. Parents in the expanded services group are called weekly to report to the psychologist who has performed the individual training of the amount of training actually implemented each day and to discuss any problems occurring during tutoring.

SUMMARY OF SITE REVIEW: A formal site visit for site review was made March 2 and 3, 1986. Since this was the initial site review made by EIRI staff, the visit had not only the purpose of reviewing the program, but the additional mission of clarifying procedures and forms to be used at other research sites. In addition to the EIRI site coordinator, the co-directors of EIRI were included in the site review. The site coordinator arrived a day ahead of the rest of the team to organize procedures. It was determined that a schedule for the day would be helpful in order to use time of the staff and the review team most efficiently. This procedure was adapted for subsequent reviews at other sites.

During the review process it was found that certain worksheets associated with the existing draft of the evaluation instrument were not helpful to the process and there was subsequent revision. The site review report indicated exemplary services and made only one suggestion. Although the staff in the program have such good rapport with the parents that a formal complaint procedure would likely not be needed, it was suggested that a written due process procedure would comply with federal guidelines.

DATA COLLECTION: Outcome data are collected for children and families in both groups in the spring of each year. Measures have been carefully selected to measure the effects of the program on both children and families in a way that allows comparison to other projects in the study as well as focusing in on some of the uniquely important aspects of this project.

Pretest: After parent consent was obtained and children were assigned to groups according to their scores on the UPAS, parents were contacted and individual appointments were made with parents for the pretest battery consisting of: Battelle Developmental Inventory (BDI), Family Support Scale (FSS), Family Resource Scale (FRS), Family Inventory of Life Events and Changes (FILE) and the Family Adaptability and Cohesion Evaluation Scales (FACES III). The BDI was administered by a trained diagnostician who was not involved in providing other services to the family or the project and who was unaware of the child's group assignment. Testing occurred at the center where services are provided to all families. Parent report measures were completed by the parents and returned to the diagnostician coordinator. A copy of the data is kept at ACDS and original protocols are sent by certified mail to EIRI. Direct observational data concerning child behaviors is also collected weekly by a trained observer who was unaware of assignment to the groups. This data is used to assist in the decision of goals to be used in parent training. The interdisciplinary team also evaluate the progress of the child on checklists of specific developmental skills to determine not only the acquisition of the skill, but the quality of the performance. The checklists are updated daily.

Posttest: Posttesting for the pilot study occurred during the last two weeks of May and the first week of June 1987. Appointments were made by the diagnostician coordinator and assessments were completed by trained diagnosticians who do not provide other services to the family or the project and who are unaware of the child's group assignment. In addition to the pretest measures, the child's progress was measured on the Cattell Infant Intelligence Scale and the Uniform Performance Assessment System (UPAS) and the parent's attitudes were measured on the Carey Temperament Scale. Parent's skill in working with the child on the target behavior is recorded on video tape for analysis. A 10-point scale has been developed to code the parent and child interaction on these tapes. The degree of involvement of the parents as reported by the staff was further delineated in order to get more accurate information concerning the effectiveness of the additional parent training. Two forms will be completed for each child by the child's teacher and the psychologist. In addition to progress as measured by the formal assessments, progress is measured using direct observation of children on the target behaviors. This observation is made weekly by a trained observer who is unaware of group placement of children.

Assessment Management: In the fall of 1986, an assessment coordinator was hired. She trained three diagnosticians. The assessment coordinator originally hired had difficulties with the assignment. A new coordinator is scheduled to be trained September 2 and 3, 1987. She is a licensed school psychologist and has experience working with preschool children who have Down syndrome. Through observation of videotapes made of assessment and the protocols, it was determined that two of the first three assessors' performance was not adequate. An add was placed in a local paper for educational personnel and five people have been interviewed and recruited for assessment. These people all have training and experience in assessment. Another two may be hired. These people will be trained September 2 and 3 also. It is anticipated that this larger number of trained assessment personnel can finish the work in less time and that the newly recruited coordinator will be able to provide close supervision. Videotapes will also be used for posttest assessment and using the 10-point scale for scoring. After the spring pilot testing, it was determined that the assessment personnel needed training in use of the video camera which will be included in the September 1987 training.

DATA ANALYSIS: Outcome and cost data have been collected for the 24 children and families who participated in the pilot program. These data are currently being coded, verified and entered into the computer for analyses. It is anticipated that these analyses will be completed by October 1987 prior to initiations of the next phase of the project.

FUTURE PLANS: A new assessment coordinator was hired and she and five additional diagnosticians will be trained September 1 and 2, 1987. With a larger number of diagnosticians it will be possible to complete the pretesting more efficiently. The research plans will be explained to parents of children who have entered the program since fall 1986. The social work staff will make these contacts and invite parents to participate. Selected families who were being served in 1986 but did not sign consent forms last year will be contacted by the psychology staff to see if family circumstances permit participation at this time. It is anticipated that additional enrollment will bring the subject number to 70 for the beginning of treatment October 1.

Pretesting and child evaluation for IEP goals will be completed for all families during September in order for basic and expanded services to be implemented beginning on or about October 1. During September, the expanded service group families will be assigned to a psychologist for individual training and times for training will be negotiated.

Inservice training for the social work staff and other personnel who have been employed since the project began will be provided by EIRI coordinator during an early September site visit. Questions concerning interface of various facets of data collection and research implementation details will be discussed and the role of the social work staff in the research project will be clarified. It is anticipated that the expanded services will be provided to the group until late May 1988 and posttesting will be completed in June 1988. A similar schedule will be followed in subsequent years through 1990.

A parent advisory group is being organized by the site coordinator. This group will help interface with the parents concerning questions about the research and to maintain current addresses. Details of the function of this group will be decided in a September site visit meeting, but it is anticipated that the site coordinator will contact the parent advisory group weekly. The group will be helpful in mainly contact now and will be invaluable during the longitudinal phase of the study as the children outgrow the early intervention services.

Data on the cost of the center-based program and the additional parental involvement component will continue to be collected. In addition, as children enter school programs, costs of varied placement will be collected and analyzed.

ARKANSAS SCHOOL FOR THE DEAF
Project #16 (Program Difference)

COMPARISON: Hearing Impaired Children--Oral/aural versus total communication (TC) training

LOCAL CONTACT PERSON: Jerrie Sue Finch, Director, Area Services (501)371-2554

EIRI COORDINATOR: Chuck Lowitzer

LOCATION: Fayetteville, Forest City, Little Rock, Russelville, and Van Buren, Arkansas

DATE OF REPORT: 9-8-87

RATIONALE FOR THE STUDY: While proponents of oral and total communication have long argued the relative benefits of the two approaches (White & Stevenson, 1975), empirical evidence in support of one method over the other remains inconclusive. Grove and Rodda (1984) reviewed results of five studies with elementary aged children that indicated that children in TC programs had better cognitive and language skills than children in oral programs, while Nix (1981) included three studies with the opposite findings in his review. Nix also included studies that led him to question claims made by proponents of TC programs that first, children's auditory and verbal skills are enhanced by the use of signs, and second, that parents in these programs learn to sign to the extent that parent/child communication is established at desirable levels. Additionally, proponents of the oral/aural method have argued that manual communication interferes with development of verbal skills (Chason & Zuckerman, 1976).

Most research with hearing impaired populations has been conducted using experimental groups of questionable comparability (e.g. none used random assignment or described criteria used to assign children to groups), and few studies have been conducted with preschool aged children. EIRI researchers are conducting an integrative review of early intervention for children with hearing impairments, but an extensive search has thus far identified only eleven such studies, two of which addressed the oral/TC issue. While at least one measure of child development indicated that TC children performed better than their oral counterparts, both studies were flawed by major threats to their internal validity, inadequate descriptions of both sample characteristics and intervention strategies, and by questions regarding the adequacy of the measures used.

The present study is designed to address the major weaknesses of prior studies. Comparability of groups has been addressed by randomly assigning children to groups, and careful description of the children and families included, as well as of the intervention strategies, will be provided. Use of assessment measures that focus on communication skills, cognitive and general development, and family functioning will enhance the study's practical significance. For the purposes of this investigation, data will be presented regarding aided and unaided hearing losses of subjects (children), their ages, length of exposure to oral and/or TC programs, pretest scores on the BDI, a parent rating of general health, indication of other services received, and parent hearing status. Multiple demographic measures of family characteristics will also be presented, including SES, number of siblings and adults in the home, and racial/ethnic group membership. The intervention strategy will be fully described, and the measures of child progress will include instruments that either are normed with hearing impaired populations or have been found to effectively measure the communication skills of hearing impaired children. By including phonological data from language samples as posttest measures, the impact of manual communication used in a TC program on development of verbal skills will be assessed. Finally, continuous monitoring of treatment implementation will provide some assurance that children are treated differently between groups.

SUBJECTS: There are currently 31 children between the ages of 18 and 60 months of age (mean = 38.6, SD = 15.3) enrolled in the study. Hearing loss data for subjects are presented in Table 3.40. All children but one are caucasian, and all

Table 3.40

Study Participant Characteristics*

	GROUP			
Measure	Oral (N=14)	TC (N=17)	t	p
Age	39.71 (14.1)	37.59 (16.3)	.39	.70
Months of Prior Pre-School*	8.14 (6.0)	7.76 (7.0)	.16	.87
Hearing loss Left ear	81.4 (15.2)	89.1 (16.8)	-1.30	.20
Hearing loss Right ear	81.9 (13.9)	85.5 (20.3)	-.57	.57

* Of the oral group, 4 had no prior preschool, 6 had a TC program, and 1 an oral program. Of the TC group, 1 had no prior preschool, 12 had TC, and none had an oral program. Other children in both groups had other types of programs.

but four are from two-parent homes. Nineteen of the mothers and 23 of the fathers have at least a high school education, with 15 mothers and 2 fathers unemployed and 22 fathers in blue collar or unskilled employment (11 in each). There is a bi-modal income distribution, with eight families in the $8,000 to $11,000 range and nine families in the $20,000 to $25,000 range. Overall average income is $13,900 (based on the mid-range values found in the Parent Survey).

Criteria for inclusion: Children participating in the Arkansas School for the Deaf preschool network programs qualify for participation in the research on the basis of their age and degree of hearing loss. All children must be at least 18 months of age or judged by the preschool teacher to be ready to participate in a center-based program and have an unaided hearing loss of at least 50 decibels (DB). An unaided hearing loss of between 50 and 90 DB is considered moderate to severe, and a loss greater than 90 DB is considered profound, for stratification purposes. Children with additional handicapping conditions are generally not eligible, although one child in the study does have mild cerebral palsy. Subject recruitment will continue through December 1987, at which time it is anticipated that 50 subjects will be enrolled.

Procedures for Identification and Assignment to Groups: Children are referred to the Arkansas Preschool Network by physicians, audiologists, and hospital staff throughout the state. These children are given audiological tests and, if a hearing loss is detected, services are provided regardless of the degree of loss.

Parents of all children who meet the study's eligibility criteria are contacted by the local preschool teacher, who provides information about the research and obtains the signed consent of interested parents. Children whose parents are willing to have their child randomly assigned to oral/aural or total communication are then stratified by level of hearing loss within preschool site and assigned to groups. This results in a two-cell chart for each site, one for each level of hearing loss.

Approximately 90% of parents whose children attend the five participating centers have agreed to participate.

Information on children is received from the local coordinator as children are identified. For each cell, a computer simulated four sided die is rolled by the EIRI site coordinator. Based on the results of this roll, group assignment is determined for the next four children assigned in that cell, in the following sequences:

1 = CCEE
2 = EECC
3 = CEEC
4 = ECCE

Thus, if the die roll is a "1", the first two children in that category are assigned to the comparison group, and the second two to the experimental group. This procedure is followed to prevent site personnel from predicting a child's group assignment and to help ensure equal group sizes. At least weekly phone contacts are made to assign newly identified children and to identify any problems that may have arisen.

Subject Attrition: Eleven subjects (4 oral, 7 TC) who were receiving home-based services only and were originally enrolled were dropped from the study because EIRI staff decided that differing treatment intensity would confound the results. To date, two subjects, both in the oral group, have voluntarily withdrawn from the study. One of these children was withdrawn because her parents felt that they had lost the communication they had had using TC prior to the study, and the other child had so much prior TC training that neither she, her parents, nor her teacher could refrain from signing to her, so it was mutually agreed that she could not participate.

PROGRAM ORGANIZATION: The Arkansas School for the Deaf preschool network consists of ten center-based preschool sites in Arkansas. These sites are administered by the Area Services Coordinator, who is located at the School for the Deaf in Little Rock. The School for the Deaf is administratively under the

Department of Education. Participation in this study was suggested by preschool network administrators, who obtained the cooperation of the school superintendent, and sought the cooperation of the preschool teachers. The five participating teachers, all of whom are certified by the Arkansas Department of Education and four of whom have master's degrees, are located in Fayetteville, Forrest City, Little Rock, Russelville, and Van Buren Arkansas. Of the other sites, one site did not have a center based program, two did not have enough children receiving center based programs, and one had a teacher who was not strongly committed to participating. The teacher at the final site (Texarkana) had originally been participating, but several of the parents were subsequently unable to bring their children in for the center based program, such that the site had to be dropped.

INTERVENTION: As indicated above, all children receive half-day center based services 4 days each week, and home intervention as indicated by the SKI*HI curriculum. Children in both groups receive at least annual audiological evaluations, appropriate hearing aid selection and parent and teacher training in proper use of the hearing aids. All teachers work with children in both groups. The teacher works with one group while her aide works with the other. There are no prescribed class size limits; however, the current maximum number of children in a class is 10. In four of the five sites, the aide is the parent of a child in the class. Other parents do not participate in center-based activities.

Individualized Education Plans (IEPs) are written for each child at program entry and at the end of each academic year thereafter. Audiological, speech and language, psychological, and other assessments (e.g. occupational and physical therapy) are completed and used in initial IEP development. The Texas Language Curriculum Roadmap is used during the school year and is the basis for future IEP development and refinement. Audiological assessment is also conducted regularly, and comprehensive assessments, including all of the above components, is conducted every

3 years.

Oral/Aural Group: The oral/aural group is trained using oral intervention techniques including auditory training and development of oral skills. The primary focus of the oral/aural approach is to provide verbal stimulation along with modeling of speech sounds and reinforcing of child vocalizations/verbalizations with the goal of developing the child's auditory and verbal communication skills. Auditory training is intended to teach the child to use his/her residual hearing so that the vocalizations of other can be heard and their meanings understood.

Classroom activities are designed to promote the expressive and receptive language skills of all children, including word usage and concept development. Teachers administer the Ling Articulation Index to assess children's oral development and follow the Texas Language Curriculum for general programming guidelines. A cognitively oriented approach to instruction, which involves maximizing learning opportunities via structured and unstructured activities, is used in the classroom. Structured activities tend to be teacher directed, but in this program, they are designed to match child interests, and are prepared via lesson plans that address specific objectives for each child. These activities may vary from the original plan if the children demonstrate interest in related but unanticipated areas. For example, in a travel activity that was designed to take place in a pretend car, if a child decided that his car had wings and could fly, the activity could be redirected toward air travel.

A typical schedule for a classroom day is presented below (all activities listed are in fact language activities and include auditory training, although only one is specifically called a "language activity"):

9:00 - 9:20 AM: Group discussion of today's weather.

9:20 - 9:50 AM: Hearing aid check. Children take turns listening to the teacher with their backs to her as she makes various sounds. The child listening raises her/his hand when the sound is heard.

9:50 - 10:10 AM: Free choice activity time. Children choose a play area in which they are interested (e.g. kitchen, chalk board, toy box), and interact with the teacher and other children in that setting.

10:10 - 10:30 AM: Snack time. Milk and cookies are provided, and children must vocalize to indicate what they want. Children are also given the opportunity to practice kitchen skills, such as pouring, measuring, etc.

10:30 - 11:00 AM: Language activity. For example, children may play "housekeeper" today, using naturally occurring opportunities to communicate their wants, needs, plans, and actions to the teacher and to each other.

11:00 - 11:30 AM: Sensorimotor activity. For example, children may play "leap frog" and "London Bridge" to develop both their motor skills and their listening/attending skills.

11:30 - 11:50 AM: Clean-up and plan time. Children help clean the classroom by putting toys away, etc. Plans for tomorrow's activities are discussed, and the children's comments are used as appropriate to modify the teacher's plan for that day.

11:50 - 12:00 PM: Prepare to leave and leave.

Home visits: The SKI*HI curriculum (Clark, 1985) was designed for use in the homes of hearing impaired preschoolers. It provides training on the nature of hearing impairment, hearing aid care and maintenance, language development activities (a specific program, similar to that used in the classroom, is used to help parents develop the child's oral/aural skills), and child management. Home visitors (who are the preschool teachers in each of the participating sites) are trained to monitor child development and progress as well as parent skills and needs in order to develop an appropriate home program. The equivalent of an IEP is developed for this purpose. Home visits are initially made three times a month, and then taper off as the family gains the skills and confidence to handle the daily concerns of their hearing impaired child, as well as those of the family.

Total Communication Group: Children in the total communication (TC) group are trained using a comprehensive communication program that includes the use of oral/ aural skills (by encouraging vocalization and using the same types of auditory training used with the oral/aural group) but allows use of Signed Exact English II (SEEII) and other gestures as needed for communication. Parents in the TC group are trained in SEEII as part of their SKI*HI program and encouraged to use sign language with their child. Teachers encourage the development of both oral and manual communication skills by simultaneously speaking and signing their communications with all children, and by reinforcing all the children's efforts to communicate either orally or manually. If any child demonstrates strong oral skills, the teacher will fade the use of signing with that child. All other aspects of the intervention are the same as those described above for the comparison group.

Optional Services: Optional services are available to both groups at each site, and may include such things as additional speech therapy, parent support group meetings, and other therapeutic and day care services. The extent to which parents participate in these services, as well as type of services received, is monitored by attendance data and the parental report of additional services. These data have are currently being collected.

TREATMENT VERIFICATION: The teacher at each site works with children in both modes of communication. Classroom dividers separate the groups, such that the teacher works with one group while her aide works with the other.

A number of procedures have been implemented in order to verify that treatment is being implemented as intended. They include:

1. Collection of attendance data: The child's participation in the program is recorded according to the days of attendance at the center based program, the use of hearing aids (did the child wear his aids to the center), and the condition of the hearing aids (were the batteries working and the aids properly adjusted). Attendance at the center program has averaged 85% across the five sites, with a range of 74% to 90%.

   Attendance data on home visits are also collected, as are teacher ratings of parent participation. We are currently working on a teacher assessment of parent signing skills for the TC group. Home visit attendance has averaged 92%, with a range of 88% to 100% across sites.

2. Teacher evaluations: Teacher evaluations were completed in June, 1987, using forms designed by EIRI staff. The first of these was a qualitative ranking of direct interveners, by which the supervisor was requested to rank each teacher relative to other professionals in similar positions. Of the five teachers involved in this project, one was ranked in the top 10%, one in the top 25%, two in the top 50%, and one in the bottom 5%. The preschool supervisor spent extra time working with the teacher in the lower 5% to improve her performance, and is continuing this extra supervision. Furthermore, teacher evaluation ratings will be used as covariates in data analysis, and variability in these ratings will enhance the generalizability of our findings.

   Using the Teacher Evaluation Form #2 developed at EIRI, each teacher was rated from outstanding to inadequate (5 to 1, respectively) in each of six areas: skills, problem solving, work habits, relationships (with parents and co-workers), communication, and attitude. The average score on this measure was 24.2 of a possible 30 (sd = 6.4, range 15 to 29). No teacher was rated inadequate in any area.

   Finally, an instrument is being developed by the preschool supervisor that will be used to evaluate teachers with respect to their skills in each mode of communication, thus allowing us to assess the quality of intervention in each mode. The preschool supervisor, who was trained in a program with an oral emphasis and now has several years of experience in TC, is developing these evaluation forms. She will complete these forms by the end of August 1987.

3. Teacher evaluation of parent participation: Teachers complete an annual evaluation of parents with respect to their attendance at IEP meetings and visits, their knowledge of the child's condition (level of hearing loss) and of his program, and their support of the child's preschool program.

4. A parent satisfaction questionnaire: Parents complete a questionnaire at the end of each year that indicates their sarisfaction with program services. Areas addressed include a) interactions with program staff, b) satisfaction with their child's goals, c) satisfaction with opportunities for parent participation, d) satisfaction with services available, and e) satisfaction with their child's progress.

SITE REVIEW: A formal site review is conducted annually, and the first ASD review was conducted on April 22-24, 1987. Reviewers included the EIRI site coordinator, the ASD Area Services Coordinator, the ASD Preschool supervisor, and the parent of a participating child. Overall, the program received an excellent rating. Administrative features (e.g. written policies and procedures in place) were especially strong. Assessment procedures were unbiased and appropriate, IEPs were in place, and appropriate materials were available.

Some weaknesses in IEP goal and objective statements were identified, and technical assistance in IEP development and lesson planning was recommended. A workshop in these areas was conducted on May 25, 1987. At that time, IEPs for 1987-88 were reviewed and revised. Plans have been made for a follow-up workshop to be held in during the fall semester.

Classroom observation at two sites and videotaped observations of the others indicted that excellent treatment group separation was obtained at three of the sites. There were, however, some difficulties at the other two sites (one teacher had a tendency to use signing with one child in the oral group and another was without an aide for 29 days during the spring semester). The teacher who signed improved over time, and the other now has an aide. This teacher also did an excellent job of using TC or oral/auralism with the appropriate children when dealing with them on an individual basis. Children in the oral group in both classrooms (two children in each) will be considered to have had additional exposure to TC for the purposes of data analysis. Exposure to TC (before and after program entry) will be used as a covariate in data analysis.

Next year, personnel at ASD will change the format such that each group attends the center based program two days per week. This has the advantages of avoiding the group separation problem and the continuous "gear-shifting" between oral and TC that teachers and aids must now do. It would also allow teachers to do more individual work with the children.

DATA COLLECTION: The assessment battery includes instruments to measure program effects on both children and families. Some of these instruments are common to all sites and some are specific to the needs of the hearing impaired population at this site and address the specific research questions being asked (i.e. does use of one communication mode result in better outcomes for hearing impaired children and their families, and does the use of manual communication in TC interfere with development of verbal skills).

Pretest: The pretest battery, consisting of the Battelle Developmental Inventory (BDI), the Parenting Stress Index (PSI), Family Support Scale (FSS), Family Resource Scale (FRS), Family Inventory of Life Events (FILE), the Family Adaptability and Cohesion Evaluation Scales (FACES), and the Parent Survey, was to be administered within·four weeks of assignment to groups. Initial group assignment occurred on August 27, 1986, and intervention began on September 8, 1986. As a result of scheduling problems, seven assessments (three to children in the oral group, four to children in the TC group) were not administered until late December 1986. Families were given a $20 incentive for their participation in pretesting. The instruments used at pretest represent the core battery that is administered at all sites, and are intended to reflect the systems theory upon which the series of studies is based. Given that over half of the families in this study are in the lower income brackets, the PSI may yield some interesting data when compared to the standardization sample used by Abidin, as well as when the oral and TC groups are compared.

Testing is conducted by a trained diagnostician who is fluent in signing and is unaware of the child's group assignment. Mode of administration for the BDI (i.e., oral vs. TC) is determined by the clinical judgement of the examiner, after a period of interaction with the child and family, and the mode used is noted on the test protocol. Testing occurs in rooms provided at the child's preschool site. Mothers complete the family measures following administration of the BDI, and fathers (when possible) complete the Family Support Scale only. If the father or other male is present in the home full time but is not at the testing session, mothers are given a copy of the Family Support Scale to take home for him to complete. The diagnostician completes a testing report and transmits all data to the assessment supervisor, who checks the scoring accuracy, copies all protocols, and transmits the originals to EIRI via certified mail.

Data from the pretest battery will be used to assess the comparability of the groups at pretest and, where pretest differences are found, as covariates in posttest group comparisons. Differences between pretest and posttest will be used when appropriate to assess between group differences. Pretest BDI data are presented in Table 3.41, and indicate that the oral group obtained slightly higher raw scores in all areas, but that none of these differences approached statistical significance.

Family demographic data have not been fully analyzed because a change was made in the Parent Survey used at posttest that made pretest data inapplicable (income categories were substantially revised, for example). Table 3.42 indicates that there were no significant differences in the parent measures at pretest.

Posttest: Posttesting occurred during April and May 1987, following 9 months of intervention in the first year, with from 5 to 8 months between pretest and posttest. Future posttesting will occur in April and May of each year until 1990. The posttest battery is administered in two sessions, as described below.

The first session is conducted by graduate practicum students from the department of speech pathology at the University of Central Arkansas (UCA). Tests administered during the first year were the Peabody Picture Vocabulary Test-Revised (PPVT-R), the Receptive and Expressive Language sections of the Reynell Developmental Language Scales (each of which was administered separately), the Hodson Phonological Scale, and a language sample. These tests were selected because they have been used in previous research and were recommended by professionals from the field of deaf education to be appropriate to the research questions in this study. Each of these tests (i.e. PPVT, Reynell Receptive, and Reynell Expressive) was administered by the same student to all children. That is, one student does all the PPVT-Rs, another all the Reynell Expressives, etc. Because of the nature of these tests and the experimental comparison (oral vs. TC), these diagnosticians know the mode of communication used by the child, but are unaware of the purpose of the study. Tests are administered in the appropriate mode. The graduate students are supervised by

Table 3.41

Battelle Pretest Raw Score Means and Standard Deviations

	GROUP			
Domain	Oral (N=13)	TC (N=15)	t	p
Personal/ Social	106.31 (34.2)	102.67 (36.6)	.27	.79
Adaptive Behavior	71.62 (19.1)	65.93 (18.2)	.80	.43
Gross Motor	59.31 (16.85)	55.47 (15.2)	.63	.54
Fine Motor	40.46 (11.9)	37.87 (11.9)	.54	.59
Motor Total	99.77 (28.5)	93.33 (27.9)	.60	.55
Receptive Comm.	13.54 (8.3)	11.27 (7.1)	.77	.45
Expressive Comm.	18.85 (11.1)	16.47 (11.6)	.55	.59
Communication total	32.38 (18.8	27.73 (17.8)	.67	.51
Cognitive	36.70 (18.3)	34.97 (14.6)	.29	.78
Total Score	346.77 (103.1)	324.53 (102.7)	.57	.57

* Three of the currently participating subjects were not identified until late in the Spring of 1987, and their pretest data were not available at the time of this analysis. These results are based on Ns of 13 and 15 for the oral and TC groups, respectively.

Table 3.42

Descriptive Data and Pretest Results Demographics and Parent Measures*

Measure	Oral	TC	t	p
Mother's Education	12.1 (2.5)	11.1 (2.4)	1.02	.32
Father's Education	13.0 (2.3)	11.5 (1.8)	1.88	.07
PSI (Parent)	249.85 (31.7)	245.63 (42.4)	.31	.76
PSI (Child)	110.92 (12.8)	119.75 (26.9)	-1.16	.26
PSI (Total)	138.92 (28.9)	125.88 (18.7)	1.41	.18
FSS (Total)	76.83 (19.8)	79.00 (15.3)	-.22	.83
FSS (# of sources)	63.51 (12.6)	62.43 (14.2)	.14	.89
FRS (Total)	121.69 (23.6)	118.50 (10.3)	.45	.66
FRS (General	76.54 (10.9)	76.38 (9.5)	.04	.96
FRS (Time)	39.38 (11.8)	41.06 (5.7)	-.47	.65
FRS (Physical	30.46 (4.6)	31.31 (3.3)	-.56	.58
FRS (External	23.38 (3.98)	23.12 (4.9)	.16	.88

Table 3.42 (Cont'd)

Pretest Results, Parent Measures

Measure	Oral	TC	t	p
FACES (percieved)	57.69 (11.1)	62.13 (4.7)	-1.35	.20
FACES (ideal)	71.54 (12.1)	72.00 (7.5)	-.12	.91
FACES (discrepancy)	14.77 (11.6)	9.88 (6.5)	1.36	.19
FACES (cohesion)	38.38 (9.1)	41.56 (4.5)	-1.15	.27
FACE (adaptability)	19.31 (5.2)	20.56 (3.9)	-.72	.48
FACE Scale F	11.46 (3.1)	11.94 (3.2)	-.41	.69
FILE (last 12 months)	10.31 (5.6)	9.63 (5.6)	.33	.75
FILE (last) 24 months	2.15 (2.3)	2.00 (3.1)	.15	.88

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and adaptability scores indicate greater amounts of these factors.

faculty from UCA.

The second session is administered by the same set of naive diagnosticians, but not necessarily the same diagnostician, who administered the pretests. In addition to the instruments used at pretest, mothers complete the Parent Survey Form, the Parent Report of Child's Health, the Additional Services Form, and the Parent Satisfaction with Services Form.

Posttesting has been completed on all 28 children who received a full year of center-based services. The other three chilren entered the program in mid to late spring, and were not posttested at this time. These data are currently being reviewed and cleaned prior to computer entry, and are not yet available for analysis.

Assessment Management: Three local diagnosticians, two of whom hold Ph.Ds and the other a master's degree, are trained to administer the standard pretest and posttest measures. Student diagnosticians for the complementary measures administered are selected by the faculty at UCA based on completion of a specified set of courses in speech pathology. All diagnosticians are proficient in sign language. Testing is scheduled by the local coordinator in cooperation with the assessment supervisor, who shadow scores 10% of the test administrations. The assessment supervisor has reported that he did shadow score at least 10%, he did not retain this data, but rather used it immediately following assessment sessions to provide feedback to diagnosticians regarding their performance. However, a videotape of each diagnostician was reviewed by the EIRI assessment trainer, who attained an average interrater agreement of .88 over four diagnosticians, with a range from .79 to .94.

DATA ANALYSIS: Results of pretest data analyses are presented in Tables 3.40-3.42. Table 3.40 presents descriptive data on the children and Table 3.41 presents their Battelle pretest scores. There were no statistically significant differences in the pretest Battelle scores in any domain or subdomain, and none on any of the pretest parent measures. Pretest demographic data and treatment verification data will be used to improve the generalizability of our data by allowing us to control for family demographic differences and differences in the quality of the intervention between both teachers and modes of communication.

Posttest Battelle data are presented in Table 3.43. Battelle pretest data (in each domain) were the best predictors of Battelle posttest scores, accounting for over half of the variance in posttest scores. Pretest Battelle Total Raw Score was then used as the covariate in a MANCOVA, with treatment group as the independent variable and Battelle postest raw scores as the dependent variables. Because of the small size of the groups in this study, alpha was set at .10 to increase the power of the tests for significance. Again, no statistically significant group differences were found. Tests of the MANCOVA assumptions (e.g. normality, linearity, and homogeneity of variance) indicated that the assumptions were met (F[7,19]=.08, p>.9). As indicated by the adjusted posttest data (Table 3.44), however, there was an interaction between group membership and the covariate, in that adjusted scores were higher for the TC group and lower for the oral group. Table 3.44 also indicates the percent of variance accounted for (Adjusted R^2) by the Battelle pretest total raw score. Total Battelle raw score pretest data were then blocked into high and low score groups, and a MANOVA was performed with treatment group and Battelle pretest group (high or low) as independent variables. Once again, there were no statistically significant differences between treatment groups (Table 3.45). The substantial portion of the posttest variance accounted for by pretest Battelle data and the absence of significant treatment group differences indicate that, in the short term, use of oral/auralism or total communication makes little difference in the developmental progress of preschool hearing impaired children. In further support of this conclusion, the communication and cognitive domains were the only domains in which adjusted posttest scores did not change direction (in the adjusted

Table 3.43

Battelle Postest Raw Score Means and Standard Deviations

	GROUP			
Domain	Oral (N=13)	TC (N=15)	t	p
Personal/ Social	105.46 (36.4)	102.33 (28.6)	.25	.81
Adaptive Behavior	71.46 (18.2)	69.13 (13.8)	.39	.70
Gross Motor	60.77 (14.5)	59.97 (11.0)	.18	.86
Fine Motor	44.54 (13.0)	42.33 (11.3)	.48	.64
Motor Total	105.31 (26.9)	102.23 (21.2)	.34	.74
Receptive Comm.	15.92 (5.8)	14.73 (4.6)	.60	.56
Expressive Comm.	22.08 (9.3)	20.47 (7.4)	.50	.62
Communication total	38.00 (14.7)	35.20 (11.3)	.56	.58
Cognitive	37.77 (17.2)	34.93 (9.5)	.53	.60
Total Score	357.54 (101.3)	343.73 (76.4)	.40	.69

* Three of the currently participating subjects were not identified until late in the Spring of 1987, and their pretest data were not available at the time of this analysis. These results are based on Ns of 13 and 15 for the oral and TC groups, respectively.

Table 3.44

Battelle Posttest Means Adjusted for Pretest Total Raw Score

Domain	GROUP Oral (N=13)	 TC (N=15)	Univariate F(1,25)	p	Adj. R^2*	Effect** Size
Personal/ Social	102.75	104.69	.05	.83	.48	-0.06
Adaptive Behavior	70.00	70.33	.01	.93	.60	-0.02
Gross Motor	59.60	60.88	.18	.68	.65	-0.10
Fine Motor	43.33	43.38	.00	.98	.76	-0.004
Motor Total	102.93	104.26	.08	.79	.72	-0.06
Receptive Comm.	15.59	15.03	.11	.74	.27	0.11
Expressive Comm.	21.42	21.04	.03	.87	.44	0.05
Communication total	37.01	36.07	.06	.81	.41	0.07
Cognitive	36.64	35.91	.04	.84	.49	0.05
Total Score	348.87	351.25	.02	.90	.70	-0.03

* The R^2 reported here is that associated with the Battelle pretest covariate used in the MANCOVA procedure.

** The effect size reported here was calculated using the following formula:

$$\frac{\text{Adjusted Mean (oral) - Adjusted Mean (TC)}}{\text{Pooled standard deviation}}$$

Table 3.45

Manova Results Between Groups with Blocked Battelle Pretest Data*

Domain	Between Groups Mean Square	Error Mean Square	Univariate F(1,24)	p
Personal/ Social	256.63	795.28	.32	.58
Adaptive Behavior	12.43	180.72	.07	.80
Gross Motor	21.80	124.53	.18	.68
Fine Motor	41.67	93.36	.44	.51
Receptive Comm.	12.65	25.02	.51	.48
Expressive Comm.	30.93	55.92	.55	.46
Cognitive	87.63	161.02	.54	.47

* The Motor Total, Communication Total, and Battelle Total scores are not represented here because they are linear combinations of the above domains.

scores) to favor the TC over the oral group.

Parent posttest data have not yet been analyzed because some of the data were received late. We are currently entering these data on the computer.

FUTURE PLANS: As indicated above, the major change for next year will be the two day per week program format, with each group attending the center program on different days. Program staff feel that although this will represent a reduction in services, it is justifiable and will be acceptable to parents for two reasons: first, some classrooms are approaching or exceeding effective teaching capacity (i.e. 10 children), and the new format will allow them to serve a larger number of children (new teachers cannot be hired); and second, the teacher and aid will be able to work together with both groups, allowing both more individual attention and improved supervision of group activities.

A second change for next year will be the use of additional complementary measures specific to the needs of hearing impaired children and their families. A summary of the hearing impaired studies was presented in June 1987 at the combined Convention of American Instructors of the Deaf and Conference of Educational Administrators Serving the Deaf in Santa Fe, New Mexico. Several professionals in attendance indicated that the measures currently in use, particularly those focusing on the families, may not indicate differences between groups that may in fact be present.

A conference call with Dr. Mark Greenberg of the University of Washington, one of the most interested conference participants, was conducted by Chuck Lowitzer, William Eiserman, and Bob Rittenhouse on July 21, 1987. Dr. Greenberg suggested that the PPVT be dropped as a posttest measure due to problems of inconsistency with the TC group (the signs for some words have forms that may indicate the correct answer, whether or not the child knows the word). Dr. Amy Lederberg is working on a signed version of the PPVT, and we will contact her to see if that instrument is appropriate. Dr. Greenberg also observed that our family measures may miss some important factors particular to families of hearing impaired children. He suggested that we get some process-focused evaluation data that looks at the families' response to intervention, their knowledge and understanding of deafness, and their interactions with the child at home. He suggested two measures to be considered for this evaluation, one of which he developed. The other was developed by Kazuo Nihira at UCLA for use with families of mentally retarded children, but Dr. Greenberg has found it to be useful with families of deaf children as well. We will investigate these suggestions, and seek further input from others in the field, including Kay Meadow and Amy Lederberg.

As children graduate from this program, methods for tracking them will be implemented, other appopriate complementary measures may be added, and cost data for the program will be analyzed. In addition, costs of later school placement will be collected.

CITIZENS FOR THE DISABLED--PRIME CARE II
Alternate #1 (Age at Start)

COMPARISON: Mildly to Severely Handicapped Children--Early intervention services begun before age 3 versus after age 3

LOCAL CONTACT PERSON: Kathleen Cullen, Program Director, Citizens for the Disabled or Marietta Schneider, Coordinator of Prime Care II

EIRI COORDINATOR: Kathryn Haring

LOCATION: Belleville, Illinois (St. Louis Suburb)

DATE OF REPORT: 9-9-87

RATIONALE FOR THE STUDY: There is a general belief that intervention begun at lower ages improves the outcome of preschool programs. Several researchers have concluded that little empirical evidence supports this conviction (Karnes & Teska, 1975; White & Casto, 1985). There is some evidence in the literature surrounding early intervention for disadvantaged children (Weikert, 1967) and for hearing impaired children (Horton, 1976) that an earlier age of intervention produces more gains. There is less information concerning the age at start as an intervention variable in the special education literature. Research, experimental in design, is needed to develop a more conclusive data base.

Bronfenbrenner (1974, 1968a) has developed a compelling rationale for early home-based intervention. He believes that a survey of the research indicates an infant's dependency on its mother develops gradually throughout the first year of life. This dependency reaches a maximum during the second year and then decreases as the child forms new interests and attachments. This finding has been interpreted to imply that a mother-infant intervention program begun before age 3 would be more effective because of the infant's more intense early dependency. The present research will provide empirical evidence to support or refute this interpretation.

The effects of starting intervention at birth as opposed to at 3 years of age is being studied within the framework of family systems theory (Haley, 1976) to assess the impact of earlier intervention on both child and family outcomes.

PROGRAM ORGANIZATION: The Citizens for the Disabled (CFD) is a private, state-funded facility which offers service to handicapped individuals from birth to 21 years of age. There are vocational work programs and classrooms on the site. The Prime Care II portion of CFD provides services to children birth to 3 years who are identified as handicapped. A home teacher serves as the coordinator of both the classroom and the home-based Prime Care II. Prime Care II serves a two-county, primarily rural, Caucasian population. Funding for the home-based program, the only section of the program that has participated in the research project, was provided by a grant from the state of Illinois as a part of the Preschool Pilot Program funding initiative. Thus, the state provided funding to expand the CFD into the home-based program that we are studying. Prior to the new state funding, the CFD only offered center-based intervention, and the birth to 3 year olds were not fully served.

SUBJECTS: Citizens for the Disabled has expanded services to two counties in which no early intervention services were being provided for 0 to 3. Over the past year, 28 children have been assigned to treatment and delayed treatment groups. There are currently 22 children in the study. The sample is 95% Caucasian with one Black child. The mean income for both groups is between 15,000 and $19,000 annually. The mean number of years of education for both mothers and fathers in both groups is between 12 and 13 years. The subjects are mainly residing in rural areas of western Illinois. Descriptive data for posttested subjects are presented in Tables 3.46 & 3.47.

Criteria for Inclusion: Children in the programs participating in the CFD/Prime Care project qualify for participation in the research on the basis of their age and type and severity of handicapping condition. All new children must be 24 months old or younger at the time they are enrolled in the project. This cut-off point was selected to ensure that children are able to participate in the study for at least 12

Table 3.46

Pretest Variables for Experimental Groups in the Citizens for the Disabled Project

Variable	Late Group			Early Group			t value
	N	Mean	SD	N	Mean	SD	
BDI							
Total Raw Score	12	151.67	61.00	10	117.60	71.47	1.21
Personal-Social DQ	12	81.00	14.16	10	72.30	18.47	1.25
Adaptive Behavior DQ	12	81.42	19.00	10	72.60	28.21	.87
Gross Motor DQ	12	74.58	35.61	10	63.30	43.70	.67
Fine Motor DQ	12	94.25	22.33	10	74.80	22.15	2.04**
Motor Total DQ	12	79.00	30.80	10	64.60	29.98	1.10
Receptive Communication DQ	12	87.08	17.09	10	81.00	19.09	.79
Expressive Communication DQ	12	86.17	20.36	10	83.00	20.49	.36
Communication Total DQ	12	81.92	19.90	10	78.10	19.98	.45
Cognitive Total DQ	12	77.67	32.08	10	72.20	29.67	.41
BDI Total DQ	12	74.00	24.74	10	64.10	25.75	.92

* $p < .1$

** $p < .05$

Table 3.47

Demographic Variables for Experimental Groups in the Citizens for the Disabled Project

Variable	Late Group			Early Group			t value
	N	Mean	SD	N	Mean	SD	
Parent Stress Index Total (mother)	13	260.31	39.46	11	213.36	80.30	1.77
Parent Stress Index Total (children)	13	122.00	17.49	11	179.00	242.37	-.78
Family Support Scale Total (mother)	11	26.91	14.31	10	28.00	12.28	-.22
Family Resources Scale Total (mother)	11	115.73	14.44	10	105.40	41.91	.74
FACES Raw Score - Perceived (mother)	11	61.64	8.10	10	84.30	79.56	-.90
FACES Raw Score - Ideal (mother)	11	78.55	5.03	10	134.00	202.18	-.87
FILE Total Score	11	12.45	5.50	10	12.10	6.42	.14
Education of Mother	13	12.38	2.43	10	13.30	2.75	-.85
Education of Father	10	12.50	2.46	8	13.88	2.48	-1.18
Occupation of Mother	13	1.31	1.38	9	.67	1.00	1.19
Occupation of Father	10	1.50	1.35	7	1.71	1.11	-.34
Income	13	5.69	2.66	9	5.44	3.01	.20

Education mean is reported in years.
Low numbers on occupational status indicate low SES as determined by Duncan (1979).

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and Adaptability scores indicate greater amounts of these factors.

months and are still enrolled in their respective programs before reaching age 3. Severity is determined by the subjects' developmental quotient as established by the Battelle Developmental Inventory. A score of -2 standard deviations on a major domain or a score of -1.5 standard deviations on the total BDI qualified children for inclusion in the study.

Procedures for Identification and Assignment: Children in each program who meet the minimum age and severity criteria are included as subjects in the study. Subjects are thus identified and randomly assigned to groups on an ongoing basis. For each child who meets the study criteria, parents must indicate willingness to participate in either the experimental or the control conditions depending upon their random assignment. As explained below, random assignment has taken place in two stages--during the feasibility year and after the longitudinal studies were initiated.

During the feasibility year, subjects from the Citizens for the Disabled were randomly assigned on the basis of handicapping condition and age. There were four cells for handicapping condition, which included:

1. Delay in general development (30% below age level on Minnesota Child Development Inventory)
2. Sensory Impairment
3. Language Delay only, and
4. At-risk or behavior disorder.

The age levels used were birth to 18 months and 19 to 36 months. A coin was flipped to determine the first placement and placement alternated after that within cell.

At the end of the feasibility year, when the longitudinal studies were initiated, those students previously assigned on a random basis were continued in the study, but the procedures for assigning additional subjects was changed. Assignments were made after stratifying subjects on the basis of severity of handicap and age. Battelle DQ scores were used to create a 3 x 3 matrix, as shown below, where severe was defined as a DQ of 0-52, moderate was defined as a DQ of 53-68, and mild was defined as a DQ of 69-84.

Chronological Age by Months

	0-20	21-35	36-60
1 Mild			
2 Moderate			
3 Severe			

If the child is the first child identified in a particular cell, a die with the numbers 1 through 4 appearing on it is rolled. The number on the die determines the assignment for the next four children in that cell as follows:

# Appearing on Die	Assignment Pattern
1	ABAB
2	BABA
3	ABBA
4	BAAB

Where A = High Intensity Intervention
B = Low Intensity Intervention

This process is repeated for each cell, and each new set of four children within a cell.

All assignment to groups is made by the EIRI coordinator to ensure that no program staff has knowledge of where a particular incoming child will be placed. All children who are identified as eligible for the program are included in the accessible population. At this point, no one who has been approached has refused to participate.

Subject Attrition: Five subjects have turned 3 and graduated to other programs within the public schools. There are 22 subjects who may be posttested, 2 additional subjects refused posttesting, 4 have moved and have proven difficult to track, and one subject has only recently been assigned to treatment. An analysis of the attrition is planned.

EXPERIMENTAL INTERVENTIONS: The early intervention is planned for one group. Both groups will receive public school intervention when they turn 3.

Early Intervention Group: This group is participating in home-based intervention beginning before age 3 consisting of bi-weekly home visits, a bi-monthly parent sharing group, bi-monthly parent support group, and access to physical therapy, occupational therapy, and speech and language services. The Teaching Research Curriculum in combination with the Portage and Carolina curricula are utilized for the home intervention. The program philosophy is based on meeting parent needs. Parent support is individualized with a variety of types of individual and group opportunities available.

The content of each home-based session is based on (a) recommendations made by the multidisciplinary assessment team, which typically includes a psychologist, speech/language pathologist, OT/PT, educator, and the child's parent; and (b) the child's progress over time. An Individual Habilitation Plan (IHP) is developed for each child based on this information and is used to guide the educator in working with the parent during the sessions. A variety of assessment instruments and curricula are utilized to develop the specific objectives in the IHP.

The home intervenors are well trained in a nondirective family-oriented approach. The Prime Care II project has videotapes that all home intervenors view, and the project provides frequent inservice training of staff. The most recent inservice was conducted by Carl Dunst.

The program keeps detailed documentation of each home-based session. Their files include all necessary information and well developed IHPs. The home visits are conducted in two weekly sessions with a total duration of approximately 3 to 4 hours per week. The home teachers consistently demonstrate an excellent rapport with the families served. The families tend to be rural and of low to middle SES. The home teachers base intervention on individual needs of the families and targeted child. Some families lack knowledge of child development and have unreasonable expectations of their child with disabilities. The teachers spend a portion of the visit encouraging the child's parent to express their needs, concerns, and frustrations. The underlying philosophy of the CFD Prime Care Program is that the family's needs are a priority and must be dealt with first. In some cases, the intensity of the intervention with the parent is equal to the intensity of the intervention with the child.

The intervention with the child is carried out with the parents observing and as involved as possible. The home teachers instruct parents in methods, strategies, and knowledge for working with their own child. The direct programming for the children is individualized and based on developmental sequences. The activities conducted during home visits is carefully documented by the home teachers. Activities are designed and implemented in order to meet individual goals set in the areas of language/communication, gross/fine motor, cognitive, self-help, and family needs.

The schedule of a home visit includes: warm-up play period, discussion of current concerns and child's status, direct 1:1 programming designed to meet specific objectives, work with the parents, discussion of progress made towards objectives and data recording. When ending the visit, the teacher reminds the parent of the next visit and of any scheduled therapies; leaves data sheets, program descriptions, detailed instructions, and materials for the parent to use; and gives the parent encouragement and praise. Program data and anecdotal notes are recorded for each home visit. For example, the teachers create data recording sheets for parents that include the following: (a) a specification of the activities to be conducted; (b) spaces to record date and duration of activity; and (c) spaces to record correct and error or progress made towards the objective. In some cases, the only data recorded by parents is whether or not the activity took place or how the activity went. For example, in a feeding program, the key data to record would be that the child was successfully positioned or that the child consumed 2 ounces orally.

The teachers keep more detailed data on number of trials, correct and error rates, and a specified description of what progress took place towards each objective worked on. The teachers' anecdotal records describe the session, the parent's and child's response, and plans for the next session.

The content of the home visits are based on (a) recommendations made by the multidisciplinary assessment team, which typically includes a psychologist, speech/language pathologist, OT/PT, educator, and the child's parent; and (b) jointly by the educator and the parent based on the child's progress over time. An Individual Habilitation Plan (IHP) is developed for each child based on this information and is used to guide the educator in working with the parent during the sessions. A variety of assessment instruments and curricula are utilized to develop the specific objectives in the IHP.

The IHPs are evaluated on a quarterly basis. All goals which have been achieved are recorded on a quarterly summary by the multidisciplinary team. During the site visit described below, 10% of the IHPs were randomly sampled and evaluated and found to be age appropriate, developmental, and functional in nature.

Later Intervention Group: Children will be pre- and posttested, but will receive no direct services until they enter a public school program at age 3. A once-a-month phone contact made by one of the home intervenors will occur in order to maintain contact with parents and insure their continued participation in the study. This has been less than successful in assuring control group cooperation. Six control group subjects have been lost to posttesting. Two who were contacted sought services elsewhere and refused to be posttested.

Optional Services: The CFD program offers a bi-monthly parent sharing group and a bi-monthly parent support group. The sharing group is conducted by an interested professional and is informational in nature. The parents are instructed on different issues related to child development and handicapped conditions. The parents are free to question and discuss. At some meetings, parents participate in activities designed to teach techniques and strategies for working with their children. The bi-monthly support group is more informal. Parents generate the topics for discussion. The parents discuss with staff and each other their immediate needs and concerns. It is reported that a majority of the treatment group parents access one or other of the parent groups.

TREATMENT VERIFICATION: A number of procedures have been implemented in order to verify that treatment is being implemented as intended. They include weekly contacts with the site and three visits to assess the quality of the intervention. The following additional data was collected:

1. Collection of attendance data. The child's participation in the program is recorded according to the length of the session and the staff involved. Nonattendance at regularly scheduled sessions is also recorded according to the reason for nonattendance (e.g. child illness, holiday, etc.). Attendance averages over 80%; all missed sessions are rescheduled for make-up.

2. Parent report of time: Parents complete post cards on a weekly basis, which indicate (a) how much time they spent with a staff member of the program, and (b) how much time was spent working with the child on activities suggested by the program. Data indicates that 71.4% of parents have returned post cards.

3. Annual teacher evaluations. Annual teacher evaluations are conducted by the administrative director. Results of the evaluations indicate that the teachers are highly competent, qualified, and are performing at a level of excellence.

4. Additional services data. Additional services data was collected in order to assure that there are true differences between groups in services received. This data indicated that two delayed treatment group subjects have received a significant level of service from other agencies. These two subjects have been disqualified from posttesting.

SITE REVIEW: A formal site review was planned for 6/25/87-6/27/87 as an addition to ongoing program verification activities. However, abrupt withdrawal of funding due to state monitor recommendation ended the program earlier than anticipated. Fortunately, the EIRI site coordinator had made three site visits to the project prior to this in which the home visits were observed, folders were reviewed, and teacher training procedures were observed. The CFD onsite coordinator completed a Program Verification packet, as did the EIRI site coordinator.

The results of the evaluation indicate that each child has an appropriate, current IHP. Both the home teachers develop detailed lesson plans, with data collection systems that were observed being implemented in the home visits. Individualized Family Service Plans (IFSP) were observed demonstrating consistent documentation of level of performance, family need, long- and short-range goals and objectives, medical problems and restrictions, and special services the child or family may receive. The IFSPs are reviewed quarterly and revised as needed.

The staff have been observed providing good modeling for both children and family members. The staff are a resource to the families and help them improve their interactions with the child. Staff provide a great deal of positive reinforcement and good parenting skills, and especially reinforce small increments of change.

It is evident that the intervention has taken place as planned. No recommendations for technical assistance or improvement in program implementation have been forthcoming from the EIRI site coordinator. The CFD coordinator has expressed a desire for additional staff supervision; however, this is not feasible in the current budget.

DATA COLLECTION: Pretest: Parents of each child participating in the study have completed an informed consent form and provided demographic information. Children have been administered the Battelle Developmental Inventory, and parents completed the Parenting Stress Index, Family Support Scale, Family Resource Scale, Family Inventory of Life Events and Changes, and the Family Adaptability and Cohesion Evaluation Scales as pretest measures. The BDI is administered by a trained diagnostician who is unaware of the child's group assignment. Testing occurs at a center which is centrally located to the programs. This ensures that the testing setting is equally unfamiliar to all subjects. Thek primary caretaker completes the family measures following the administration of the BDI. Married mothers and those with spouse equivalents are also given a copy of the Family Support Scale to take home for their husbands to complete. The diagnostician completes a testing report and transmits all data to the EIRI site coordinator.

Posttest: Posttest measures will be collected after children have been in service for 12 months and will consist of the Battelle Developmental Inventory and the various parent questionnaires mentioned above. In addition, a parent satisfaction with treatment questionnaire and parent report of child's health will be administered at posttest. A project-specific posttest instrument, which will assess the differential effects on developmental functioning of beginning intensive center-based services early versus later, will be the Sequenced Inventory of Communication Development. Additional parent report measures to be administered at posttest will be the Child Improvement (Locus of Control) Questionnaire and a temperament questionnaire. The Sequenced Inventory of Communication Development was chosen as a complementary measure because of the emphasis of the intervention employed which focuses on communication development. The Locus of Control Questionnaire was chosen as a complementary measure in order to assess parent's perceptions of control in an intervention configuration which involves home-based intervention with very young children. A temperament questionnaire (either the Toddler Temperament Scale or the Behavioral Style Questionnaire, depending on the child-s age) was chosen as a complementary measure because of the expected impact of the program on the child's behavioral style.

Assessment Management: Two diagnosticians were trained to administer pretest and posttest measures. One diagnostician has a master's degree in psychology, the other has a bachelor's degree and experience as a parent-infant educator. All diagnosticians are "blind" to the child's group assignment and the research design.

DATA ANALYSIS: The pretest data has been scored, checked, coded, entered, cleaned, and analyzed. The posttest data is in the process of being coded. It is anticipated that pre- to posttest analysis will be completed in October 1987.

FUTURE PLANS: As described earlier, funding for this site is not stable. There are also questions concerning what service the state will require next year. The site is willing to change the treatment, continue random assignment, and become an intensity study. The plans for next year cannot be specified at this time; they are dependent on: (a) number of subjects available for future inclusion, (b) results of present pre-post data analysis, (c) funding patterns decided by the state, and (d) service requirements of the state.

UNIVERSITY OF NEVADA--RENO
Alternate #2 (Program Variation)

COMPARISON: Behavior Disordered Preschoolers--Regular day care versus day care plus itinerant teacher intervention

LOCAL CONTACT PERSON: Eva Essa

EIRI COORDINATOR: Kathryn Haring

LOCATION: Reno, Nevada

DATE OF REPORT: 9-8-87

RATIONALE FOR THE STUDY: The numbers of seriously emotionally disturbed (SED) students constitute a significant national problem. According to the 8th Annual Report to Congress on the Implementation of the Education of the Handicapped Act (1986), the numbers of SED students receiving services under EHA for the last 9 years have steadily increased from a low of 283,072 in the 1976-77 school year to a high of 373,207 in 1984-85.

A common concern shared by special educators and those in general education is the prevention of more serious emotional disturbances in children with mild behavior disorders, by providing treatment when the disability is less severe (Atkeson & Forehand, 1982; U.S. Department of Education, 1986). Conduct-disordered children are the most common referrals to mental health centers, and surveys indicate that from 1/3 to 1/2 of all child referrals from parents and teachers are concerned with these kinds of problems (Atkeson & Forehand, 1982). State directors of special education report a need to enhance the ability of general education to better accommodate and serve these children, and a need to develop cooperative relationships between special education and general education in working with this population (National Association of State Directors of Special Education, 1985). State directors also believe that when the ability of general education to address these needs is limited or absent, it is more costly for special education and related areas to provide services (National Association of State Directors of Special education, 1985). In support of this assertion, a study conducted by Baker and Perkins (1984) found that the early prevention of emotional problems is more cost-effective than delivering treatment when emotional problems escalate to more severe disturbances.

In view of the fact that it is most cost effective to provide services to mild behaviorally disordered children rather than to deliver services when problems escalate, it seems logical to provide treatment to preschool children who, because of age, are likely to have a shorter history of behavior problems, compared to older children. However, research in this area is very limited in comparison with other age levels (Mastropieri & Howell, 1981). In fact, there have been relatively few group design experimental studies involving preschool-age behaviorally disordered children (Mastropieri, Scruggs, & Casto, 1985). An exception is a study by Mastropieri et al. (1985) which attempted to ascertain whether treatment begun when children are 3-4 years old is effective in preventing later behavior problems.

Providing service to behavior disordered children within their natural setting (i.e., day care) supports the intent of PL 94-142; however, research into this model of service provision is lacking. The present study will demonstrate: (a) the relative effectiveness of providing behavior intervention in the day care center; (b) whether parent training in behavioral principles is more effective than intervention in the day care center alone; and (c) whether the intervention effects are durable.

PROGRAM ORGANIZATION: The Reno Day Care project is conducted through the University of Nevada-Reno (U of N-R). The local site coordinator is a professor at the university who is responsible for hiring three itinerant behavior specialists. An assistant coordinator is responsible for management of assessment, training, and supervision of the behavior specialists.

The project is carried out in 20 day care centers in the Reno area. Most of the centers are privately funded; several are franchised facilities that are part of a national chain. The day care centers are all licensed by the state of Nevada.

No formal relationship between the U of N-R existed prior to initiation of this research. A few center directors were graduates of the U of N-R Child and Family Studies Department; however, most of the day care staff were not university trained.

SUBJECTS: Forty-four preschoolers classified as aggressive and behavior disordered who were enrolled in day care settings in the Reno, Nevada metropolitan area were randomly assigned to the two treatment conditions. The children are primarily Caucasian (95%). A large number of the families are single-parent households. Family incomes and education levels ranged from low to middle SES. The mean years of education for mothers was 13 to 14 years for all groups.

Descriptive data for the subjects and their families is presented in Tables 3.48 and 3.49. No significant group differences were identified in the pretest data.

Criteria for Inclusion: A telephone survey was taken of 40 day care centers. The nature of the study was explained, and centers with children who presented serious aggressive and disruptive behaviors were asked to participate. The centers that were interested were required to document with frequency data that they served from one to four aggressive children. Children who met age requirements and who had a frequency of three or more daily acts of physical, verbal, or object aggression met criteria for inclusion in the study.

Procedures for Identification and Assignment: Twenty-four centers were identified as willing to participate, and 56 children who met criterion were selected for inclusion. Of these, 20 centers serving 44 behavior disordered children, consented and participated in the study. The children were randomly assigned into treatment or no treatment groups based on the staff-child configuration in each classroom. Each center was paired with a center similar in terms of the number of children identified as subjects and the number of day care staff willing to participate. A coin was then flipped to determine group placement. Parents of children in the intervention group were then paired, and a coin was flipped to Insert

Table 3.48

Parent Measure Means - Reno

GROUP COMPARISONS

VARIABLE	TREATMENT GROUP (Teacher Training)			NO DAY CARE			TREATMENT GROUP (Teacher and Parent Training)		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Parenting Stress Index TOTAL SCORE (mother)	246.13	37.40	16	258.06	33.73	17	240.78	29.21	9
Mothers Education	14.00	2.13	16	13.71	2.05	17	14.00	2.12	9
Family Support Scale TOTAL SCORE (mother)	20.79	4.82	16	26.93	14.00	14	24.22	10.45	9
Family Resource Scale TOTAL SCORE (mother)	114.63	27.60	16	124.35	14.13	17	129.89	15.05	9
FACES III Discrepancy TOTAL SCORE (mother)	12.38	7.44	16	12.31	8.47	16	8.13	5.82	8
FACES III Cohesion	37.81	5.39	16	39.82	4.49	17	36.00	9.80	8
FACES III Adaptability	21.50	4.91	16	21.65	6.17	17	21.75	7.87	8
FILE TOTAL SCORE Past 12 months (mother)	13.53	8.85	15	11.94	4.81	17	9.56	6.50	9

ANOVA'S were conducted on the above parent measures and no significant differences were found.

NOTE: On the PSI and FILE, higher scores indicate more stress. On the FSS and FRS, higher scores indicate more sources of support or increased satisfaction with those sources of support. On the FACES, a higher discrepancy score indicates more dissatisfaction with the family structure. Higher cohesion and Adaptability scores indicate greater amounts of these factors.

Table 3.49

Battelle Raw Score Means by Group - Reno

VARIABLE	BDI RAW SCORES TREATMENT GROUP			RAW SCORE TEACHER TRAINING GROUP			RAW SCORES FOR TEACHER & PARENT TRAINING GROUP		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Personal Social	130.22	18.14	18	127.59	19.08	17	125.78	9.76	9
Adaptive Behavior	81.56	13.42	18	83.88	7.65	17	84.44	12.15	9
Gross Motor	71.50	8.17	18	67.47	8.22	17	70.89	8.25	9
Fine Motor	51.11	8.23	18	47.76	9.03	17	50.22	11.01	9
Motor Total	122.61	15.81	18	115.24	14.69	17	121.11	18.50	9
Receptive Communication	30.56	7.51	18	28.41	7.98	17	30.56	10.35	9
Expressive Communication	43.39	7.58	18	40.29	7.54	17	40.56	8.13	9
Communication Total	73.83	14.49	18	68.71	14.41	17	71.11	17.42	9
Cognitive Total	61.22	18.02	18	58.41	16.09	17	64.22	19.86	9
Battelle Total Score	469.44	70.30	18	453.82	56.96	17	466.67	73.18	9

ANOVA'S were conducted on the Battelle Raw Scores for all variables by group and no significant differences were found.

determine if they would be offered parent training. The EIRI coordinator completed the random assignment to insure against bias.

The subjects were judged to be behaviorally and developmentally homogenous. Due to potential problems with contamination, all children in an individual center were randomly placed in the same treatment condition. The original random assignment insured the children were placed in relatively equal groups.

Subject Attrition: A number of subjects were dropped from the study for various reasons. One subject was removed from his home and placed in a foster home; necessitating removal from the center he was in. Three other subjects were removed from the study; one due to lack of consistent attendance, and two were asked to leave the center. The data will be analyzed to determine whether or not this was random attrition.

EXPERIMENTAL INTERVENTIONS: The intervention has taken place as described below.

Regular Day Care: There were 20 day care centers in the Reno, Nevada metropolitan area. These centers provided 5-day-a-week day care. As part of the regular daycare, day care operators provide preacademic instruction and other educational programming. Based on observations by EIRI staff prior to the onset of the study, a variety of physical structures were observed; many were large and served ages ranging from 6 months to elementary school age children. The centers generally served fairly large numbers of children. Typically, each room was structured to house 20-25, three- and four-year-olds, with two staff members assigned to each room. Center directors reported that keeping skilled staff was difficult because of the minimum wage pay scale.

The daily schedules across centers are surprisingly similar and include: free play, a time for preacademic skills development, snack, outdoor play, lunch, nap, and more free play, or occasionally an afternoon activity. Centers varied on the number and quality of materials and activities, but most had manipulative toys, blocks, trucks and cars, books, and large motor equipment. Typically, activities are planned to develop preacademic skills. Large amounts of time are devoted to free play and outdoor time; however some organized art activities are conducted.

The daycare staff demonstrate a range of skills and experience with children. The low pay promotes high staff turnover. Prior to intervention, the day care staff did not generally demonstrate behavior management skills. For example, day care staff were observed verbally reprimanding children and attending to children's inappropriate behaviors more consistently than reinforcing appropriate behaviors.

Augmented Condition: Children in this condition continued to participate in the basic day care program, but teachers of these children were visited regularly by one of three behavioral specialists who worked on an itinerant basis. These behavioral specialists were responsible for working with the classroom teacher to observe the behavior disordered children in the classroom and develop a behavioral program which was implemented by the day care staff. The specialists then made weekly visits to the classroom to make sure that treatment was being implemented and to collect observational data. The augmented treatment program continued for 8 weeks. Although the behavioral specialist designed the treatment program, responsibility for implementation was given to day care staff.

As described below, training for the augmented condition consisted of three components: (a) an initial 8-hour training session; (b) weekly visits to individual classrooms, and (c) a series of five small group meetings. Prior to the initiation of the intervention, an 8-hour training session was developed and delivered to the participating day care personnel. This training session included orientation, definitions, and exploration of behavioral intervention strategies. During the initial 8-hour workshop, the following was covered:

1. A theoretical/philosophical base for positive guidance with young children.

2. An overview of behavioral principles of reinforcement, shaping, extinction, etc. (using lay terms).

3. A brief review of the developmental characteristics of preschool-aged children, particularly 3 year olds.

4. A discussion of self-concept and techniques to build positive self-image in young children.

5. A discussion of how to foster internal control of behavior.

6. The importance of consistency in working with young children.

7. Setting realistic rules of expectations for preschoolers.

8. Other factors that influence child behavior: home and family, health, allergies, inability to deal with over-stimulation, inconsistent adult behavior/expectations, child temperament, etc.

9. The importance of providing support and positive feedback for parents of difficult children.

The five additional group sessions were conducted in the context of weekly group meetings between behavior specialists and the day care staff. During the meetings general reinforcement and more indepth coverage of the information discussed during the initial 8-hour workshop was provided as appropriate. Also, there were small group discussions of the week's activities, focusing on progress made by specific children. Behavior specialists worked with day care staff to help them relate what happened in the centers to the principles discussed in the workshops and weekly meetings. Discussions also focused on providing techniques for helping parents cope with difficult children.

During the weekly intervention sessions, the behavior specialists spend about 2 hours with each day care staff. The following activities took place: The behavior specialist observed the day care staff for at least a half hour and recorded data on verbal interactions between teacher and children, nonverbal cues, attending to (or ignoring) specific child behaviors, group management, handling of aggressive incidents, if these occur, etc. The behavior specialists then met with the day care staff member and discussed the observation. Following the discussion, the trainer worked with the teacher on programming for the individual children in the class. For example, the teacher trainer might use modeling to help the teacher deal with a situation. The behavior specialist would suggest specific interventions for individual child behaviors.

The intention of all three portions of the training (i.e., initial training, individual classroom visits, and group meetings) was to be positive and supportive to the participating teachers. At the same time, the teaching of appropriate guidance skills, good early childhood education principles, and sound child development information were emphasized.

Each behavior specialist was observed by the EIRI site coordinator. They were skilled teachers with solid early childhood backgrounds. They spent from 1-1/2 to 2 hours weekly observing and discussing each target child. The behavior specialist would take notes on what preceded certain aggressive behaviors and how the day care staff consequated the behavior. Behavior specialists would end the intervention with a feedback session with the participating day care staff member. The behavior specialist would suggest the use of positive reinforcement, ignoring, redirection, and prevention techniques for aggressive behaviors. In many cases, the behavior specialist recommended environmental and schedule changes to assist the day care staff. For example, in cases when children were required to attend for long periods of time to preacademic or fine-motor tasks (these activities were required for up to 3 hours in some centers), the teachers recommended a break for gross motor play. Behavior specialists also made recommendations about altering the physical environment so it would be more inducive to appropriate behavior. For example, the center environments were not always conducive to creative or dramatic play. In several instances, teacher trainers suggested modifications to encourage materials and an area for dramatic play.

The day care staff were, in general, open to the recommendations of the teacher trainers. Teacher trainer records indicate that day care staff did make increases in positive reinforcement, reduction in negative comments, and increases in appropriate ignoring. Positive environmental and scheduling modifications were also noted in the augmented day care centers.

Augmented Condition with Parent Training: One half of the subjects who received the augmented condition through the behavior specialists were randomly assigned to also receive parent training. The parent training was based on a behavioristic model and required data taking on the parent's part. Typically, one or more problem behaviors were identified by the parent. A baseline was taken on the behavior, an intervention was designed and implemented, and ongoing data was collected by the parents. The parents met on an individual basis with the parent trainer weekly for approximately an hour. At this time, parents were trained in behavioral interventions and strategies.

In the first session, the parents were given a Knowledge of Behavior Principles test. They were asked to describe their child and target the behaviors to change. The concepts of social learning and interaction patterns were introduced. The definition and use of reinforcement was discussed. The participants were taught data collection methods, were given charts, and were instructed to complete a baseline on a target child behavior. A reading from the book Families was assigned.

In Session 2, the baseline data was reviewed and further discussion of reinforcement took place. Parents were instructed on specific methods to increase desirable behavior. Parents were assigned: (a) readings, (b) to implement a behavior program with their child, and (c) to continue to collect data.

The following three sessions were involved with the discussion of readings, data, general principles, specific program, and treatment progress. The parents were expected to have completed two treatment programs during the five sessions.

Optional Services: Parent training was offered to a random sample of one half of the intervention groups. Nine parents in this group completed the parent training.

TREATMENT VERIFICATION: A number of procedures have been implemented in order to verify that treatment was implemented as intended. They included weekly contacts and three visits to the sites conducted by the EIRI coordinator. Additionally:

1. Observational data: As previously described, the centers were continuously observed. Four trained diagnosticians spent 1-1/2 hour per child observing as a pretest and repeated as a posttest measure. The teacher, child, and environment were assessed. In addition, four trained "blind" observers made bi-weekly observations at each center. They recorded frequencies of child aggression and nature of teacher reinforcement.

These data indicated a trend towards more appropriate teacher reinforcement patterns in the treatment group.

2. Staff evaluations: Two evaluations of the participating day care staff were conducted; one was collected prior to intervention and one immediately following. A wide range of staff abilities and characteristics were reflected in the evaluations. The two groups were fairly well balanced in the numbers of good staff and those who needed improvement prior to the intervention.

3. Environmental survey: The diagnosticians also completed a five-page evaluation of the center environments prior to intervention and immediately post-intervention. The surveys prior to intervention indicate that a nearly equal distribution of environmental characteristics existed across centers. In other words, an equal number of "adequate to good" and "needs improvement to poor" environments were represented in the randomly assigned centers.

SITE REVIEW: A formal site review was conducted by the EIRI coordinator May 5-7, 1987 in order to provide independent data about the degree to which the experimental interventions were being implemented, and to identify areas in which technical assistance should be provided. This project is logistically unusual in that over 20 day care centers are participating. A random sample of six centers were selected for observation during the site review. The site was also unusual because the centers are not special education facilities. For example, day care centers do not develop IEPs and IHPs, nor do they have assessment procedures in place. Only lesson plans of the three- to four-word type were observed. The schedules were typically not set up to offer 1:1 teaching sessions.

Staff use of positive techniques of guidance, redirection, anticipation of potential problems, and positive reinforcement were not generally observed with nontreatment classrooms. There were more instances of these staff behaviors in centers that had received the intervention. Inappropriate disciplinary procedures were observed; for example, shouting and long-term time out, again more often in the untreated center. Generally, in day care settings children were expected to listen and respond as a whole group.

Each of the three behavior specialists were observed implementing the intervention program. They were highly skilled and knowledgeable. As previously described, they observed the targeted children, took notes, and offered positive feedback to the day care staff. The behavior specialists observed the targeted children and took narrative notes on the child's behavior and interactions. Then, the behavior specialists would share their observations with the key day care personnel involved. The teacher trainers would suggest general management and reinforcement strategies.

There were differences noted between the regular and augmented day care centers. The augmented centers demonstrated more flexible scheduling and less punishing behavior on the part of day care staff. The augmented center's staff reported satisfaction with the intervention. They felt conditions in the centers and their own skills had improved. The newly trained staff expressed belief that the intervention benefited all the children as well as making specific improvements in the subject's behavior. The results of the site review indicated that the intervention took place as planned.

DATA COLLECTION: Due to the nature of intervention in this study, a large number of observational, staff report, and parent report data were collected. It was critical to demonstrate that the children were, in fact, behavior disordered and limited instruments exist for this purpose. The Achenbach has a separate score for aggression, which was the primary behavior identified as problematic.

Pretest: The parents of each child participating in the study completed an informed consent form and provided demographic information. Children were administered the Battelle Developmental Inventory, and parents completed the Achenbach Child Behavior Checklist, Parenting Stress Index, Family Support Scale, Family Resource Scale, and Family Inventory of Life Events and Changes, and the Family Adaptability and Cohesion Evaluation Scales as pretest measures. Parents were compensated for the time spent in testing with a $20 payment. Direct observation of each child in the classroom was also conducted. This observation included a 15-minute sample of the teacher's communication and reinforcement. Additionally, a 10-minute time sample of the child's activity level, his or her aggressive acts, and the amount of teacher attention he or she received was completed. A rating scale was used to describe the environmental conditions in each classroom and was administered by the diagnosticians. Diagnosticians who had no knowledge of the research project were trained for reliability on the observational instruments and administered them prior to treatment.

Posttest: All of the previously described pretest parent and family measures and the classroom observations were conducted at the termination of the intervention. In addition, a parent satisfaction with treatment and parent knowledge measure were administered. The key day care personnel filled out the Walker Problem Behavior Scale and the California Preschool Social Competency Scale. The complementary measures were selected to assess the behavioral gains which are expected to result from an intervention which focuses on helping teachers to better manage the aggressive and other inappropriate behaviors exhibited by these behaviorally disordered preschoolers. Posttest data has been collected on 40 subjects. The BDI was not administered as a posttest measure because the intervention only lasted for 2 months and significant differences were not anticipated over such a short time.

Ongoing Observational Data: Four observers who had no knowledge of the study were selected and trained for reliability. They conducted ongoing bi-weekly 2-hour observations of the targeted aggressive children. They also observed a nontargeted child as a comparison.

Assessment Management: The EIRI staff trained and certified four master's degree level diagnosticians to administer the BDI and the Classroom Observational Instruments. Reliability checks on the observations were conducted three times for each diagnostician by the assessment supervisor. The assessment supervisor also sent videotapes of the testers administration of the BDI. The tapes demonstrated a high degree of tester competence. All testing took place at the University of Reno, in a setting equally familiar to all subjects.

The posttesting was not managed by the original assessment supervisor. The family measures were mailed out to parents and then returned by mail or collected by testers. The Walker Problem Behavioral Scale and California Social Competency Scale were taken to centers, explained to staff, and collected by testers. These measures were completed by a staff member who participated in the study and by one who was equally familiar with the child, but who did not participate in the study. This was in order to achieve a measure of reliability for those instruments.

DATA ANALYSIS: The pre- and posttest measures have been scored, rechecked, and coded. The pretest data has been entered and analyzed. The posttest data is in the process of being entered.

FUTURE PLANS: The subjects are now on a longitudinal track. They will be tested with the BDI in January of 1988, and the family measures and the Achenbach will be administered. EIRI will determine if the effects of this short-term intervention are durable.

Eight of the children will graduate to public schools within the 1987-1988 school year. We will continue to track their progress and collect data on school placement. For example, are they receiving special education services, retention, and standardized achievement tests? As the remainder of the subjects graduate, EIRI will institute the same procedures for tracking their school progress.

IV. THE EARLY INTERVENTION PROGRAM INVENTORY

Option 4 of the contract with the U.S. Department of Education requires EIRI to develop a data collection system which is capable of providing information about existing early intervention programs with respect to program components and costs, demographic information about participating children and families, and the effects of the program outcomes. The system is designed for use by local, state, or federal administrative agencies who are responsible for the operation of several early intervention programs. One of the ultimate goals of the Early Intervention Program Inventory (EIPI) is to establish a data base that can serve as a "bench mark," whereby results from program evaluations can be compared. Potentially, this system will first assist service providers and researchers in determining whether a given program or given type of program is superior to alternative programs, and second, reduce the need for establishing control and comparison groups in future studies of the effects of early intervention. Another important goal of the EIPI is to provide a useful system for identifying trends in current early intervention program practices which can subsequently lead to systematic variations of key program characteristics in early intervention service.

The objective of the 1986-87 year has been to develop the data collection protocol and conduct preliminary pilot tests and, for two parts of the protocol, conduct main field tests. The following section will report on the development of four portions of the protocol and briefly outline the activities which have been undertaken in its formative. Each of the four portions of the protocol will be presented: Part A, the Description of Programs, which is designed to collect descriptive data on program and client characteristics; Part B, the Description of Children, is designed to collect demographic data about children and their families; Part C, Description of Program Costs, is aimed at identifying and valuing all of the resources used by each early intervention program; and Part D, Description of Program

Effects, is aimed at collecting data on the effects of early intervention programs in terms of specific child performance data.

The development of Part A, the Description of Programs, presented the greatest challenge to the designers, mainly because of the complex nature of the programs and the multitude of decisions required in determining the degree of specificity of the description. Thus, this year has been primarily devoted to developing and conducting the preliminary pilot tests and the main field tests of Parts A and B. Additionally, Part C, the Description of Costs, has been developed and preliminary pilot tests have been conducted. Since the remainder of this fiscal year will focus on the main field tests of Parts B and C, and the further development, pilot testing, and main field testing of Part D, this report will focus more specifically development and testing efforts of Parts A and B. Before the results of the main field testing of Parts A and B are presented, however, an up-to-date description of the development process of each part of the EIPI will be given. Appendix 3 includes the most recent version of the EIPI which was the product of all the pilot and field testing up to this time.

Descriptions of Protocols

Three considerations were important in developing the EIPI. First, the protocol needed to be efficient (i.e., generate useful information without requiring excessive time, given the complex nature of the information being collected). Since teachers and program personnel who would be using the protocol have many constraints on their time and energy, it was important that the completion of the protocol require minimal time. Second, the protocol needed to be simple to use. A program's ability to use the EIPI could be influenced by start-up time. The feasibility of using the EIPI on a broad basis could depend on how much technical support and assistance is required to complete the protocol. Third, the protocol needed to produce accurate information. A data collection system which is easy and efficient to use would be of no value if it yielded incorrect data. In order to address the above considerations, development processes unique to each part of the protocol were carefully implemented.

Part A: The Description of Programs

The process of developing Part A of the EIPI required numerous formative stages. The main challenge was determining the level of question specificity which could efficiently and simply produce both accurate and useful results. The initial drafts of Part A were aimed at collecting detailed descriptive data about programs and program participants, with the intention of quantitatively "capturing" the unique nature of each program according to eight areas of programming: setting, instructional groupings, duration and intensity of service delivery, curriculum, staffing patterns, types of services available, family involvement, and philosophical orientation. Subsequently, a set of detailed items, The Description of Programs, was created for the first three of the eight areas. It was determined, however, that the level of detail of the first draft would not produce enough information about the programs to allow them to be grouped for comparative purposes. Additionally, it was determined that the level of detail of the first draft of The Description of Programs was, at face value, inefficient and overly complicated to complete. Because it was still necessary to collect data in each of the eight areas, the decision was made to collect several pieces of descriptive data for each of the eight areas, in some cases, in a less detailed manner, which could result in a system for meaningfully classifying and comparing programs.

The formative process which followed was one of re-evaluating each potential question or objective under each descriptive category and determining which questions were most likely to yield data (whether specific or general in nature) which would be useful in creating meaningful classifications of programs. This process involved several providers of early intervention programs whose comments resulted in a set of questions which would be addressed under each of the eight descriptive categories. Once the questions were agreed upon by the staff and the participating service providers, the questions were presented to the Advisory Committee for feedback. The consensus of the advisory committee at that time was that the eight descriptive categories were appropriate, as were the respective questions or objectives being addressed. The advisory board suggested that preliminary pilot testing proceed.

The process which followed was one of developing specific items to address the questions or objectives. As groups of these items were compiled, they were informally pilot tested with the service providers (those who were most likely to be the ultimate respondents of the protocol). After a number of revisions, which were the result of the informal pilot testing, each of the eight descriptive sections and their respective items were compiled to form the Description of Programs part of the EIPI. This version was then formally pilot tested with three early intervention service providers.

The purpose of the EIPI was explained to three service providers and they were asked to complete the Description of Programs in the presence of the institute staff member responsible for developing the protocol. During this pilot testing, the developer noted any difficulties respondents had in completing any of the items, answered any questions that they had and noted those questions, and followed the completion of the EIPI with a debriefing with the respondent. During the debriefing, the developer asked for any suggestions about making the EIPI more efficient, more simple to complete, and/or more accurate with respect to its proposed purpose. The pilot tests resulted in several revisions of the Description of Programs leading it to a form ready for the main field testing which would involve 10 early intervention service providers in the state of Utah. The methods and results of the expanded pilot testing of the EIPI are included in the section following the descriptions of the other parts of the EIPI.

Part B: Description of Children

The process of developing the Description of Children part was similar to the process used for developing the Description of Programs. It was determined that the description of children should include items pertaining to the following areas: race or ethnic origins, guardianship, parents' employment status, and type and severity of the child's disability.

The challenge in developing the child description part, was not in determining the question areas, but in determining the most effective way to gather information in each of these areas. A number of item formats were created for each question. These items were informally pilot tested with service providers and other research and evaluation experts before a format for each itme was tentatively determined. These items were then compiled to form the child description part of the EIPI. Preliminary pilot testing was conducted simultaneously with, and in the same fashion, as the preliminary pilot test of the program description part. When the respondents raised questions or had difficulty with a given item, they were presented with alternative item formats and asked which format was more satisfactory or, if they had any suggestions of their own for improving the format. The preliminary pilot testing resulted in revisions of the items putting the child description part in a form ready for the main field test. The results of this main field test are included with the main field test results of the program description.

Additionally, it was determined that the results of the Battelle Developmental Inventory (BDI) be reported for each child in the program in order to assess the effects of early intervention programs as well as for descriptive purposes. While the BDI provides useful data pertaining to Personal-Social, Adaptive, Motor, Communication, and Cognitive domains, it does not yield data useful in categorizing visually and/or hearing impaired children. Furthermore, as questions have been raised pertaining to the validity of the BDI, one of this year's efforts has been to determine if indeed the BDI is the best available measure to obtain useful descriptive and evaluative child data, if another measure would be more useful, and/or if the BDI could be augmented with items pertaining specifically to vision and hearing abilities to make it a more satisfactory measure for descriptive purposes.

Simeonsson's ABILITIES model (in press, which appears in Appendix 4) was identified as one possible alternative for obtaining child description data. This model was developed to obtain descriptions of children's functional capacities which would be a useful classification index. It allows group data of children to be summarized in a global and concise manner, according to the functional abilities of the children. The model contains 10 variables reflecting a child's most critical areas of functioning: Audition, Behavior, Intelligence, Limbs (arms and hands), Interpersonal communication, Ionicity, Integrity of physical status, Extremities (legs), and Sight.

While Simeonsson has implied the potential value of the ABILITIES model for describing participants in early intervention programs, it has not been systematically field tested. Thus, it was decided to conduct a preliminary field test of the ABILITIES model to determine its reliability, practicality in administration, and its usefulness in describing a sample of children with handicapping conditions, all of which would make it appropriate for use in the child description section of the EIPI.

Three teachers of preschool classes for children with handicapping conditions (with ages ranging from 31 to 62 months and a mean age of 49 months) were asked to complete the ABILITIES model for each of their children and were paid a consultant's fee for their services. These teachers were full-time, experienced, and each taught one class in the morning and one in the afternoon.

After reviewing the ABILITIES form, the three teachers were trained by Dr. Simeonsson to complete the ABILITIES model during a 15-minute teleconferencing training session. During this training, Dr. Simeonsson explained each of the categories on which the children were to be rated, as well as each of the potential response levels and answered any questions.

During a 1-1/2 hour period, the teachers completed the ABILITIES model for each of their children, without any of the children present but with access to the children's records. This required approximately five minutes per child. At this time, the teachers were also asked to indicate which of each other's children they knew well enough to complete the ABILITIES model. Subsequently, the teachers performed three additional assessment activities two weeks after the first administration of the ABILITIES model. First, in order to assess test-retest reliability, teachers were asked to complete the ABILITIES model a second time for each of their children (again using any available records which might help them). Second, reliability was also assessed using a scramble and match technique. Each teacher was given a random selection of five completed ABILITIES forms (which were replicas of the protocols from the first administration of the model) without names on them. In addition to the completed protocols, the teachers were given a list of five names of their students. They were then asked to assign names from their list to the appropriate completed ABILITIES form. Third, to assess interrater reliability, the teachers were asked to complete the ABILITIES model for each of the children in each others classes whom they had indicated as knowing well at the time of the first administration of the model.

Additionally, the BDI was individually administered by professionally trained diagnosticians to each of the 36 children during the month preceding the completion of the ABILITIES Model.

Based on the various sources of data, the following conclusions were reached. First, the scores from the ABILITIES Model were very reliable when tested in a test-retest fashion. Second, interrater reliability was also quite high given that there was some variance between teachers in their familiarity with the students. Third, the model was efficient to use because the teachers only required approximately three to five minutes to complete the model for each child. Fourth, the model was too heavily weighted with motor functions. Fifth, several of the subscales (the two tonicity subscales and the extremities subscales) did not discriminate as well as had been hoped. Finally, while a number of the ABILITIES subscales correlated with BDI subscales as was expected, there were several correlations which were counter intuitive.

Consequently, it was determined that the ABILITIES Model did not, comprehensively, contribute more information than the BDI. However, it was concluded that the incorporation of the Hearing and Sight Scales from the ABILITIES model with the BDI, would provide a more comprehensive description for visually or hearing imparied children. The present form will be further developed and prepared for field testing during the remainder of this year.

Part C: Description of Costs

The section of the EIPI designed to describe the costs of the program was based on work done previously by the institute in conducting cost effectiveness and cost benefit studies of early intervention programs. Following Levin's (1983) "ingredients approach," the protocol for cost analysis is designed to assist programs in making a comprehensive inventory of the inputs of their service delivery. The protocol consists of two sections. The first section is a description and valuation of personnel resources, including volunteer time used by the program per annum. Since personnel costs typically account for a significant portion of a program's total cost (60-80%), these data are collected in great detail. The second section contains a description and valuation of non-personnel resources, including contributed space, equipment and materials, used by the program per annum. Together, these two categories provide a complete picture of total resources consumed by an early intervention program. This total cost is then divided by the number of children, or another relevant unit of analysis to show the cost per unit.

The development of the Cost Analyses section of the EIPI required two main stages. First, during the first year of the longitudinal studies project (1985/86), the cost forms were developed by conducting intermittent informal pilot tests with personnel at sites participating in the feasibility studies. Second, after several revisions were made, the forms were formally pilot tested with three of the feasibility study sites in Illinois. This pilot study led to several significant revisions which resulted in the basic cost analysis protocols used by the institute in all of its studies. This basic protocol was then adapted for use with the EIPI in preparation for the main field testing to be conducted during the remainder of this year.

Part D: Description of Effects

Numerous ways of measuring early intervention program effects in the absence of rigorous control groups have been proposed. Most are highly suspect for the purposes of this contract because they are theoretically incorrect, or they are easily compromised by personally invested users. A norm referenced evaluation model, however, appears to be best suited for these purposes of this contract.

In such a system, children would be measured at the beginning and the end of a program with instruments which have age-appropriate norms available for the children being served. For example, if a 30-month-old child scores at the 25th percentile on the 30-month age norms of a test at the beginning of a program, and six months later at the conclusion of the program scores at the 40th percentile on the norms for 36-month-old children, the conclusion is assumed that the child has gained 15 percentile points more that would have been expected in the absence of a program. Although this approach sounds reasonable on the surface, it depends on the validity of the following assumptions:

1. The test used to evaluate the children was normed using handicapped children and has age-appropriate norms in three month increments.
2. The population of children on which the norming was done had not participated in early intervention programs.
3. The same test is used in pre- and posttest measurement, and these tests differ from those used to select children for the intervention.

In those cases where the above assumptions are met, this method offers a plausible alternative for assessing program effectiveness.

Since its introduction in the mid 1970s, tens of thousands of Title I programs have been evaluated using the Title I Evaluation and Reporting System. Ninety-five percent of all reportees have used a norm-referenced evaluation model and many authors have concluded that it provides evidence of impact comparable to that which would have been obtained had true experimental designs been used. Based on the experience in the Title I program (now Chapter I), the norm-referenced evaluation model has been determined as the best system to meet the evaluative needs of the EIPI.

It was determined that the BDI best meets the criteria of available measures and should be used only not only to describe the children being served, but as the primary measure in making evaluative judgments of early intervention programs.

MAIN FIELD TEST OF THE EIPI

Methods

To evaluate the usefulness of the first draft of the EIPI, 10 providers of preschool programs for handicapped children and their families were identified who agreed to participate in a field test. These 10 providers were given copies of the EIPI, a brief oral explanation of the purposes of the protocol, as well as an explanation of the purpose of the field testing. Because the main purpose of the field test was to collect further formative data on the efficiency and ease of using the protocol, as well as the adequacy of each item, the EIRI staff member requested that the providers indicate any problem areas or suggestions on their protocols. Further, the providers were requested to contact the staff member by telephone if any major difficulties arose while completing the protocol.

The 10 service providers involved in the field testing were from both metropolitan and rural areas throughout the state of Utah. Eight of the programs were center-based, one was home-based, and one provided a combination of home- and center-based services.

After a two-week period, all 10 completed protocols had been received in the mail by EIRI. The protocols were first reviewed for comments and suggestions. A list of comments and suggestions was compiled and used in making subsequent revisions of the EIPI. Second, the protocols were coded and the data were entered into the computer. Descriptive statistics were then obtained which would be useful in describing the results of the main field test.

RESULTS

The results of the main field test will be discussed with respect to the two basic questions which were addressed: first, is the protocol efficient and simple to use? and second, does the protocol yield information which is meaningful and useful?

Efficiency and Ease of Use. Data on the efficiency and ease of use were collected during the formative stages of the protocol, as well as by asking each of the participants in the main field testing to indicate the length of time the protocol required to complete and to comment on the ease of completing it. The results indicated that the protocols required between 40 to 65 minutes to complete per program. The participants indicated that while each item was very clear, the overall task was demanding. Approximately one-third of the participants suggested that if completion of the protocol was required as a part of a contract, supplemental initiatives should be included.

Usefulness of Yielded Information. The purpose of this section is to demonstrate how the resulting data of the EIPI might be analyzed and displayed. It should be noted that the actual descriptive results themselves are of less relevance to this field test than is the discussion of potential presentations and their usefulness when describing and classifying early intervention programs. Furthermore, the limited number of completed protocols limits to some degree the number of analyses which can meaningfully be presented. Consequently, in addition to the results of the 10 programs involved in the field testing, several hypothetical examples will also be used in discussing the potential use of results of the EIPI protocol.

Figure IV.1 provides an overall display of the 10 programs according to setting, enrollment, integration, instructional groupings, intensity and duration, and attendance. Such a display is useful in depicting the types of programs included in the sample. This display, for example, shows that most of the programs are center-based with 70% serving few than 50 handicapped students each. Several of the programs integrate handicapped and nonhandicapped students, although most do not. Instructional groupings tend to be small groups, although some time is spent in large group and one-on-one instruction. There is some variation with respect to intensity and duration, however: four to five day-per-week intensity is slightly less prevalent than less intense service. On the other hand, there appears to be an essentially equivalent percentage of programs which provide service for two to three hour durations compared to those which provide less than two hours of service per visit. With respect to attendance, most programs reported that on the average they provided service for more than one year to each child, some up to a third year. Further, all programs reported high attendance rates (above 75% attendance on the average).

While this display emphasizes predominant types of program ingredients, it also can be used as an illustration of the less dominant types of program ingredients. For example, few of the programs represented in this sample were home or combination home and center-based; few of the programs served more than 100 children and none of the programs provided services for more than 3 hours per visit.

The type of analysis shown in Figure IV.1 provides a meaningful map of the program data. However, information is lacking which would be useful in segregating meaningful groups of programs according to combinations of program ingredients. Analysis of frequency tables enables one to note emerging patterns across several different variables or ingredients which may be grouped for further analysis. For

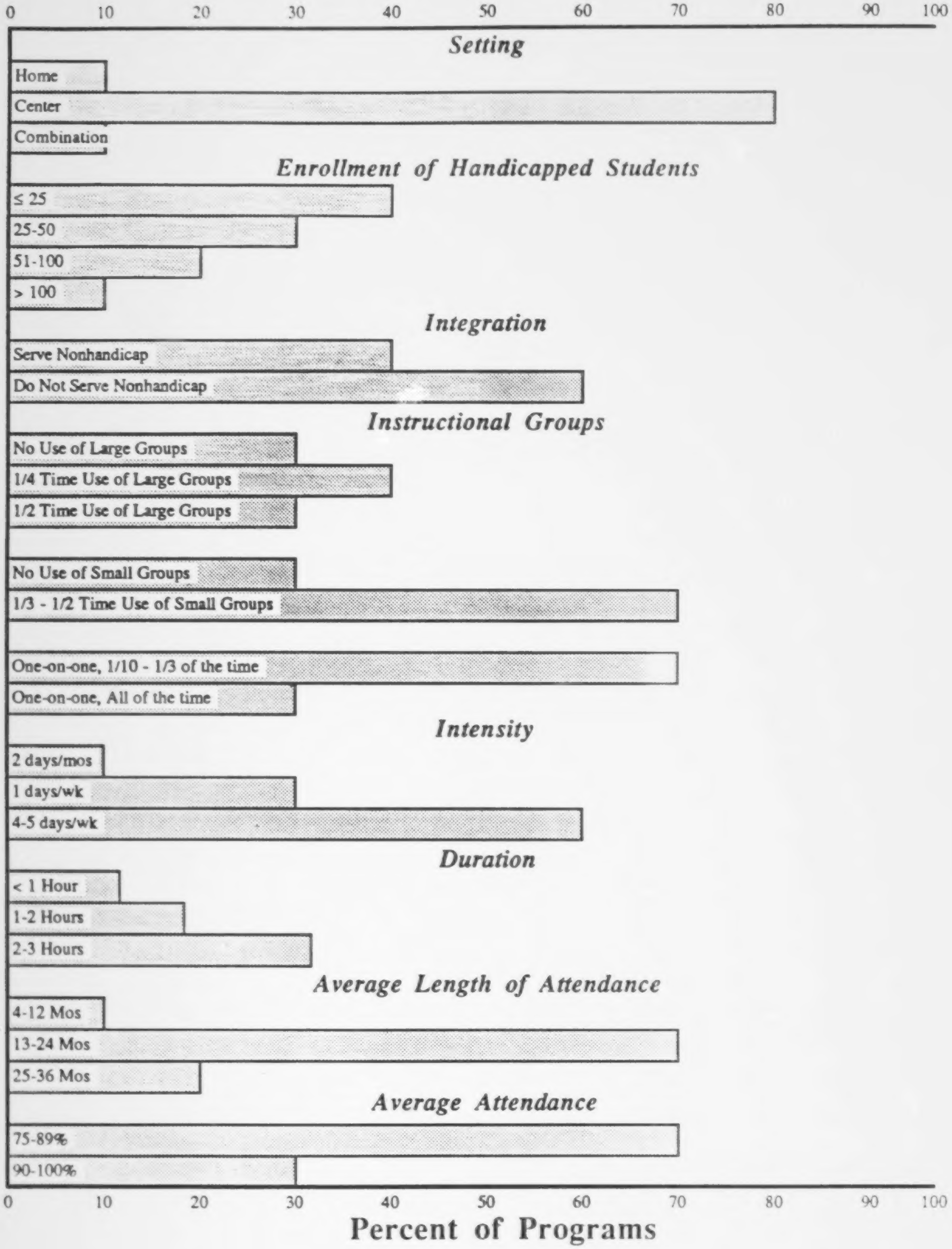
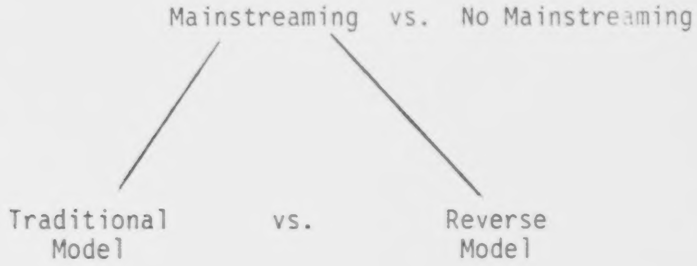


Figure IV.1: Summed Description of Program Characteristics

example, as can be seen in Table IV.1, four programs are serving both handicapped and non-handicapped students. Two of the programs, programs 2 and 7, are using a traditional mainstreaming model in which handicapped students are mainstreamed into a non-handicapped students' environment; while two other programs (1 and 5) are using a reverse mainstreaming model where nonhandicapped students are mainstreamed into the handicapped students' environment. In further comparing these two pairs of mainstreamed, center-based programs, it becomes apparent that the pair using the traditional model have identical percentages of time spent in large group, small group, and one-on-one instruction. In contrast, those using the reverse mainstreaming model reported higher percentages of time spent in one-on-one and small group instruction.

From this simple analysis, it is apparent that it is possible to classify center-based programs according to the following characteristics:



Additionally, it is plausible to group programs with respect to the ratio of handicapped students to nonhandicapped students. This would further distinguish mainstreamed programs under each of the two mainstreaming models. Depending on the sample of programs being described and compared, grouping by ratio may be more meaningful than grouping by mainstreaming model; actually creating more discrete groups.

In looking further at the center-based programs it is evident that the percentage of time spent in large groups, small groups, and one-on-one instruction is essentially equivalent across programs. Additionally, in examining these programs

Table IV.1

Individual Program Characteristics

Program	Setting	# Handi.	# Non-Handi.	Average Ratio	% Large Group	% Small Group	% 1 on 1	Intensity	Duration	Length of Enrollment	Attendance
1	Center	65	6	2.3:1*	25%	50%	25%	5 days/week	2-3 hours	13-24 months	75 - 89%
2	Center	22	197	1:10	50%	40%	10%	5 days/week	< 1 hour	13-24 months	90 - 100%
3	Center	40	0	1:0	25%	50%	25%	5 days/week	2-3 hours	13-24 months	75 - 89%
4	Combination Home & Center	10	0	1:0	0%	0%	100%	1 days/week	1-2 hours	13-24 months	75 - 89%
5	Center	16	3	2.5:1	30%	40%	30%	5 days/week	2-3 hours	13-24 months	90 - 100%
6	Home	83	0	1:0	0%	0%	100%	2 days/mos	1-2 hours	13-24 months	75 - 89%
7	Center	47	280	2.9:16	50%	40%	10%	1 day/week	< 1 hour	4-12 months	
8	Center	18	0	1:0	30%	40%	30%	5 days/week	2-3 hours	25-36 months	75 - 89%
9	Center	38	0	1:0	50%	30%	20%	5 days/week	2-3 hours	13-24 months	75 - 89%
10	Center	23	0	1:0	0%	0%	100%	1 day/week	1-2 hours	25-36 months	90 - 100%

* of a total of 8 classrooms, 2 mainstreamed, resulting this averaged ratio

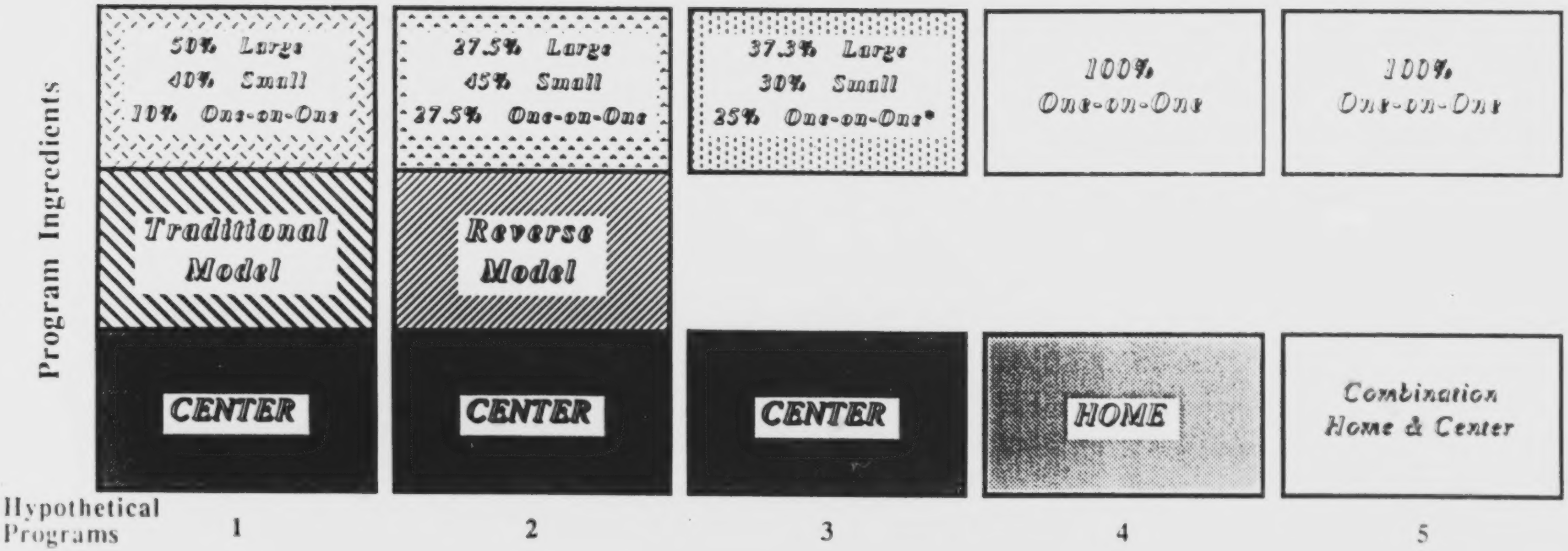

Program Ingredients
50% Large
40% Small
10% One-on-One
Traditional Model
CENTER
27.5% Large
45% Small
27.5% One-on-One
Reverse Model
CENTER
37.3% Large
30% Small
25% One-on-One*
CENTER
100% One-on-One
HOME
100% One-on-One
Combination Home & Center
Hypothetical Programs
1
2
3
4
5

Figure IV.2: **Program Ingredients Constituting Discrete Programs**

*one of the non-mainstreamed programs served infants in only an one-on-one fashion, which constitute another program type.

across the other variables in each row in Table IV.1, there appears to be only negligible differences between the programs, although there is slight variation in intensity and duration.

Once an initial scanning analysis is completed, and a preliminary sense of emerging groupings obtained, a cross-tabulation producing more precise data about the groupings can be conducted. Using the first example pertaining to mainstreamed programs, a cross-tabulation could be performed in order to develop discrete groupings of programs according to key ingredients. Obviously, grouping 10 programs has little value. If, however, each of the programs here reflected 100 programs, then such groupings would be more meaningful in understanding service patterns of early intervention programs. Further, it is likely that as the number of programs for which data are collected increases, this variance will increase also, possibly revealing other subgroups under mainstreaming pertaining to different degrees of program intensity or degrees of program duration.

Figure IV.2 illustrates one way the data of the first portion of the EIPI protocol can be used to produce discrete types of early intervention programs. As will become more evident as the results from the remainder of the EIPI are discussed, this manner of grouping programs by combinations of key ingredients could ultimately produce unwieldy numbers of groups which would be difficult to use in making meaningful comparisons. However, one of the objectives of this field test is to demonstrate how carefully selected combinations of program characteristics or ingredients which emerge may result in a meaningful and limited number of types of programs which may then be used in making cost-effectiveness comparisons.

In the remainder of this section, the results of the curriculum, staffing, services, family involvement, philosophical orientation, and descriptions of children will be presented. First, summed descriptions of these characteristics will be presented to demonstrate how general trends pertaining to those areas of service can be described. Following, the results of the scanning analysis and subsequent crosstab analyses will be presented in order to more completely demonstrate how those characteristics can be combined to form meaningful discrete groups or types of early intervention programs.

Another key ingredient in creating discrete categories of early intervention programs is the use of commercially available curriculum materials. Eighty percent of these programs use a commercially available curriculum between 10 to 25% of the time, while 20% use a commercially available curriculum between 50 to 75% of the time. When dealing with a larger set of programs, grouping programs according to commercial curriculum-use may lead to patterns meaningful comparisons. Individually, such groupings may not be very meaningful. However, when incorporated with other highly correlated ingredients, such as those to be discussed in the remainder of this section, discrete categories of early intervention programs may emerge.

The number and types of staff and types of services are another set of variables which may be useful in describing and classifying programs. For example, Figure IV.3 illustrates the groupings of programs according to staff/child ratios. Fifty percent

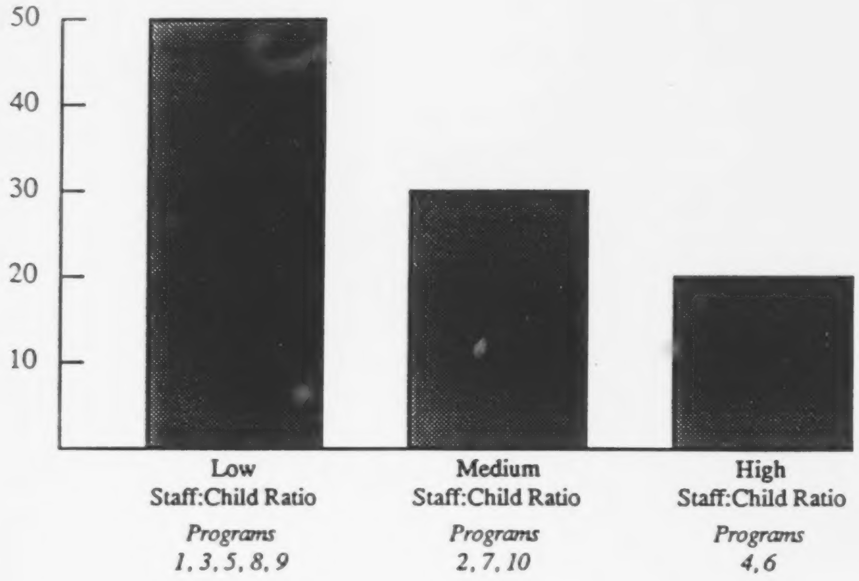


Figure IV.3: **Groupings of Programs According to Staff:Child Ratio**

of the programs have low staff/child ratios, while 30% of the programs have a medium staff/child ratio, and 20% have a high staff/child ratio. A perusal of Table IV.2 shows that there are potential staffing patterns which also might lead to meaningful groupings of programs. Groupings could potentially be made according to the number

Table IV.2
Description of Programs with Respect to Staffing Patterns

		PROGRAMS									
		1	2	3	4	5	6	7	8	9	10
STAFF	Teachers										
	Noncertified	0	86%	21%	0	0	0	0	0	0	0
	Certified	5%	6%	0	0	29%	31%	15%	24%	19%	0
	Teacher's Aides	20%	6%	35%	25%	29%	0	15%	30%	47%	22%
	Speech Therapists	5%	.4%	7%	25%	4%	31%	2%	12%	9%	22%
	Physical Therapists	4%	0	7%	25%	4%	0	0	8%	5%	22%
	Occupational Therapists	0	.4%	1%	25%	0	0	0	4%	2%	22%
	Adaptive P.E. Teachers	0	0	0	0	0	0	0	0	0	0
	Licensed Pyschologists	0	.4%	0	0	0	0	1%	.4%	0	0
	Behavior Therapists	0	0	0	0	0	0	0	0	0	0
	Psychratrists	0	0	0	0	0	0	0	0	0	0
	Nutricians/Dieticians	0	0	0	0	0	0	0	0	0	0
	Physicians	0	0	0	0	0	0	0	0	0	0
	Nurses (RN or LPN)	3%	0	0	0	0	20%	2%	2%	0	0
	Volunteers	26%	0	21%	0	29%	0	45%	4%	0	0
	University Students	26%	0	0	0	0	0	0	4%	0	0
	Administrative Staff	3%	1%	2%	0	3%	0	1%	6%	0	0
	Clerical	3%	.4%	2%	0	3%	18%	4%	4%	0	0
	Other	5%	0	3%	0	0	0	16%	0	19%	12%
	Total Students	71	219	40	10	19	83	327	18	38	23
	Ratio of Direct Service Staff:Students	1:2.1	1:8.7	1:3	8:10	1:2.9	1:20.8	1:7.5	1.2:1	1:4.4	1:6.4
	Total # of Direct Service Staff	34.5	25.3	13.2	0.8	6.6	4.0	43.5	22.1	8.7	3.6
	Total # of Staff	38.5	25.7	14.3	0.8	7.0	4.9	55.0	24.6	10.7	4.1

of different types of staff in a program, the total number of staff, different combinations of types of staff, and the amounts of those types of staff. For example, in the 10 programs, teachers' aides are the most predominantly used staff, while certified and noncertified teachers, speech therapists and volunteers are the other most commonly represented staff in the programs. Several programs rely heavily on volunteers and university students, which may be one set of variables constituting a grouping of programs. For example, one program relies on volunteers and university students to comprise more than half of the staff, while teachers' aides make up the largest portion of the remainder of the staff. Such a staffing pattern may, when describing a larger sample of programs, emerge as important in distinguishing programs which rely heavily on professionally trained staff from programs which rely most heavily on nonprofessional personnel. Additionally, it may be useful to note that there is a significant lack of programs which staff licensed psychologists, behavior therapists, psychiatrists, nutritionists, or physicians. Data presented in Table IV.2 also indicate that the staff/child ratio of the 10 programs ranged from 1.2:1 to 1:20.8 which reveals another potentially meaningful categorization of programs. Cost-effectiveness comparisons between groups of programs of different staff/child ratios could produce results which could be helpful in determining subsequent allocation of funds.

Programs may also be described and grouped according to types and amounts of services which are provided. Figure IV.4 shows that the programs could be classified by the degree of comprehensiveness of services. This example represents a normal distribution of comprehensiveness with 60% of the programs providing a medium degree of comprehensiveness. More detailed patterns can emerge by closely examining Figure IV.5. This figure shows that high comprehensiveness, as represented by Programs 1 and 8, can be characterized more specifically as programs which not only provide educational and/or developmental skill development, speech therapy and physical and/or occupational therapy to all who need it but, on a limited basis, provide an

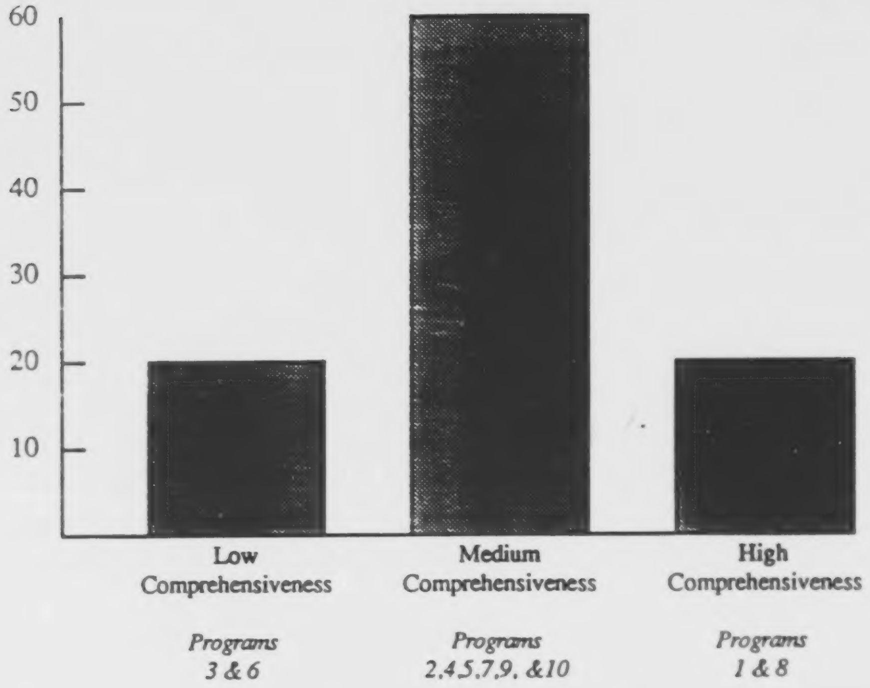


Figure IV.4: Groupings of Programs According to Comprehensiveness of Services

Program	Educational/Developmental Skill Development	Speech Therapy	Physical and/or Occupational Therapy	Adaptive Physical Therapy	Routine Medical/ Health Care	Major Medical Care	Music Therapy	Nutritional Supplements or Counseling	Swimming	Psychological Services for the Child	Psychological Services for Family Members
1	■	■	■	□	□	→	□	□		□	□
2	■	■	■	□				→		→	→
3	■	■	■								
4	■	■	■					→		→	■
5	■	■	□	□	→			→	□	□	→
6	■	□						□			
7	■	□	→		■			□		■	□
8	■	■	■	□	→		□	□	□	■	→
9	■	■	■					→		→	□
10	■	■	■					→		□	□

Figure IV.5: Services Available From Each Program

additional six to seven other services including a referral service. To the other extreme, low comprehensiveness as shown in programs 3 and 6, can be characterized as providing educational and/or developmental skill development service to all who need it and only one or two limited services. The majority of the programs provided a medium comprehensiveness of services usually including, to some degree, educational and/or developmental skill development, speech therapy, and physical and/or occupational therapy, and limited services and referrals for three to five other types of services.

Family involvement is an important emphasis of many early intervention programs, although the types of family involvement activities can vary from program to program. Hence, programs can be described with respect to different types of family involvement activities which are used. Table IV.3 shows the percentages of programs using each type of family involvement and the degree to which it is used. This display indicates that educational planning and parent training are the most commonly used family involvement activities, while family classroom aides and group meetings are used to a fairly moderate degree. Resource access, respite care, and parent-to-parent networks, however, are infrequently used. Thus, one way in which programs may be classified with respect to family involvement issues is according to whether they provide resource access, respite care, and parent-to-parent networking activities.

While no obvious patterns or combinations of family involvement activities emerged beyond those discussed above, a closer look at the results could reveal meaningful categories of programs. For example, programs which provide parent training, classroom aide activity, group meetings, program governance, and educational planning to more than half of their parents may be distinguished from programs which provide mainly respite care service and a parent-to-parent network. As with the other areas of programming, family involvement activities can vary and may be used in classifying programs for descriptive or cost-effectiveness comparisons.

Table IV.3

Extent of Program Usage of Parent Involvement Activities

	Not Available In Program	Only By Referral To Other Programs	Used By 1-25% Of Parents	Used By 26-50% Of Parents	Used By 51-75% Of Parents	Used By More Than 75% Of Parents
a. **Parent Training.** Training family members to teach the child developmental skills such as feeding, language, or motor skills. Teaching may be integrated in daily activities or at separate times in the home.			10%	20%	30%	40%
b. **Classroom Aide.** Regular participation by family member(s) (at least once a month) as aides in the classroom to assist with programming.	30%		10%		40%	20%
c. **Group Meetings.** Parent, sibling, of father group meetings at least twice a year designed to provide mutual support, information, parenting skills, or a network of people in similar situations.				60%	10%	30%
d. **Resource Access.** A structured program to assist family to obtain housing, medical care, food, counseling, or other community based services that are not provided directly by the early intervention program.	10%	50%	10%	20%		10%
e. **Respite Care** Weekend, evening, or vacation child care provided in addition to the regular program.	30%	60%	10%			
f. **Parent-to-Parent Network.** An organized program which uses "experienced" parents to contact and provide individual support and assistance to "new" parents.		40%	50%	10%		
g. **Program Governance.** Opportunities for parents to take an active role in deciding the content, organization, and staffing of the program.	30%		40%	20%		10%
h. **Educational Planning.** Parents are involved in developing their child's educational program.						100%

Additionally, programs may be differentiated according to philosophical orientations. Of all of the characteristics of early intervention programs, philosophical orientation is the most difficult to assess because there often are numerous philosophic orientations within a given program. Hence, philosophical orientation in early intervention is best characterized with respect to the degree to which a program is either behavioristic or developmental. Figure IV.6 illustrates where each of the programs fall on a continuum between behavioristic and developmental orientations. Classifications of programs with respect to where they fall on this continuum can result in categories which are meaningful for descriptive comparisons. The assessment of philosophical orientation enables programs to be grouped according to their cummulative ratings (i.e., low ratings correspond with strong behavioristic orientation, moderate ratings correspond with a cognitive/environmental orientation while high ratings correspond with a developmental orientation). Figure IV.7 shows how classifications of programs may emerge which include philosophical orientation as well as parent involvement variables.

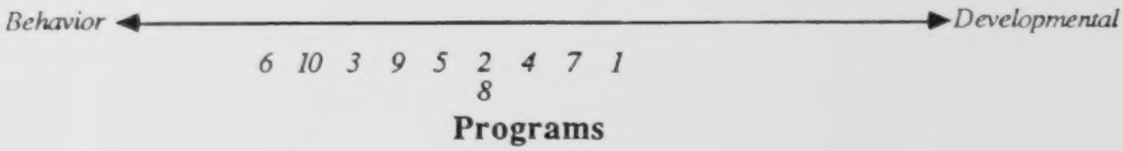


Figure IV.6: Description of Programs According to Philosophical Orientations

Thus, the Program Description Component of the EIPI yields a wide variety of information which can be used to descriptively characterize trends in early intervention programming and to classify programs according to meaningful program ingredients.

The results of the main field test for the Description of Children component, can be used in a similar fashion. As can be seen in Table IV.4 the majority of the children served by these programs were white, from two-parent homes, whose parents

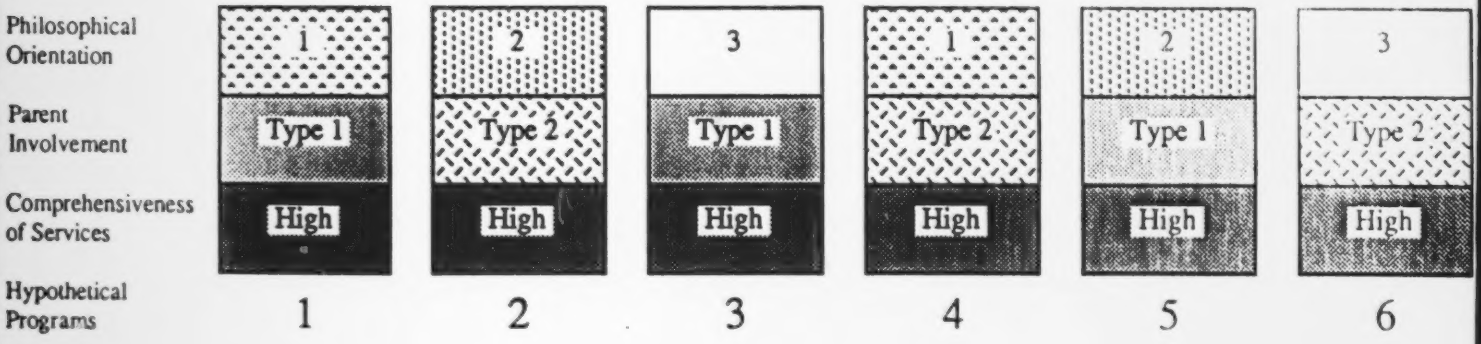

Philosophical Orientation
Parent Involvement
Comprehensiveness of Services
Hypothetical Programs
1
Type 1
High
1
2
Type 2
High
2
3
Type 1
High
3
1
Type 2
High
4
2
Type 1
High
5
3
Type 2
High
6

Figure IV.7: **Groupings of Programs**

LEGEND:

Philosophical Orientation
1. Behavioristic
2. Cognitive/Environmental
3. Developmental

Parent Involvement
Type 1: Involvement in parent training, group meetings, classroom aide, program governance and educational planning
Type 2: Resource access, respite care, parent to parent network, educational planning.

Table IV.4

Description of Children According to Race or Ethnic Origins, Parent Employment Status, and Guardianship

	1	2	3	4	5	6	7	8	9	10	TOTAL
White	52%	90%	87%	90%	75%	98%	84%	88%	90%	92%	84.6
Black	2%	0	3%	0	0	5%	1%	0	0	0	.65
Hispanic	3%	10%	5%	10%	25%	5%	8%	0	10%	4%	8.55
Asian	2%	0	5%	0	0	5%	7%	10%	0	0	1.55
Native American	41%	0	0	0	0	5%	0	2%	0	4%	4.65
Both Parents at Home	62%	54%	75%	80%	40%	73%	50%	90%	79%	87%	69
One Parent at Home	15%	32%	18%	20%	50%	25%	45%	8%	18%	13%	23.6
Living with Relatives	12%	0	7%	0	10%	1%	3%	2%	3%	0	3.8
Other	11%	14%	0	0	0	1%	2%	0	0	0	2.8
White Collar	9%	32%	20%	20%	20%	10%	1%	60%	46%	61%	27.9
Blue Collar	37%	18%	63%	70%	50%	75%	3%	25%	35%	26%	40.2
Unskilled	32%	27%	5%	10%	20%	10%	45%	10%	0	0	15.9
Unemployed	22%	23%	12%	0	10%	5%	51%	5%	19%	13%	16

were blue-collar workers. For comparative purposes, programs may be classified with respect to child characteristics such as: (a) programs comprised of homogeneous ethnic origins versus programs comprised of heterogeneous ethnic origins; (b) programs predominantly serving two-parent homes versus programs serving single-parent homes (which may be especially meaningful when classifying programs in combination with parent involvement ingredients); and (c) programs predominantly serving children from white-collar homes versus programs predominantly serving children from blue-collar, unskilled or unemployed homes. Additionally, programs can be most meaningfully categorized according to the type and degree of handicapping conditions of children they serve.

In the main field test a total of 468 children were classified by type and degree of handicapping condition. Data from the group as a whole reveal that the largest percentage of children (34.1%) were classified as having general developmental delays. This group was followed by children who were speech and language impaired (26.9%) and children who were multiply handicapped (16.7%). The remainder of the children were classified as learning disabled, orthopedically impaired, behaviorally disordered, autistic, hearing impaired, emotionally disordered, or visually impaired (22.3%). Further, the children were found to be primarily mildly to moderately handicapped. Once again, the programs could be categorized and evaluatively compared based on the populations they serve such as: (a) comparisons between several programs serving exclusive populations: hearing impaired versus visually impaired versus autistic, and (b) comparisons between programs serving children with a specific handicapping condition such as autism with more general programs serving children with a wide range of handicapping conditions. Programs categorized by degree of severity of handicapping conditions could also be compared for effectiveness. For example, there are potential comparisons between programs serving only profound populations and programs integrating all degrees of severity. Figure IV.8 illustrates each of the above potential groupings of programs according to child characteristics by which programs may be compared with respect to cost-effectiveness.

SUMMARY

The types of classifications of programs which have been presented here could be quite useful to any number of individuals or agencies responsible for overseeing a large number of early intervention programs. For example, a state coordinator of early intervention program may use the information produced by the EIPI for several purposes. First, the information could be used to determine and/or monitor current trends with respect to key ingredients in early intervention programming. In so

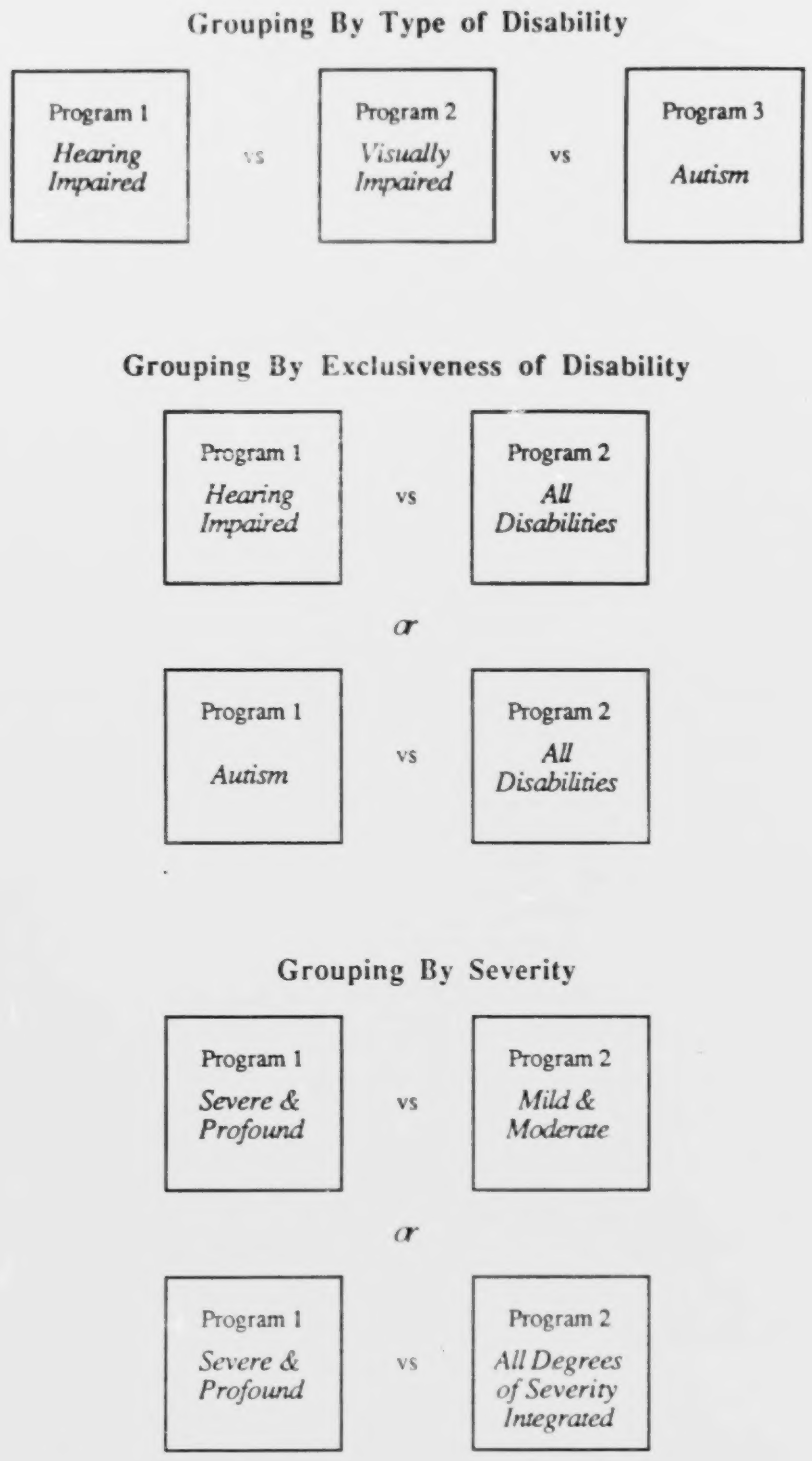

Grouping By Type of Disability
Program 1
Hearing Impaired
vs
Program 2
Visually Impaired
vs
Program 3
Autism
Grouping By Exclusiveness of Disability
Program 1
Hearing Impaired
vs
Program 2
All Disabilities
or
Program 1
Autism
vs
Program 2
All Disabilities
Grouping By Severity
Program 1
Severe & Profound
vs
Program 2
Mild & Moderate
or
Program 1
Severe & Profound
vs
Program 2
All Degrees of Severity Integrated

Figure IV.8: **Hypothetical Groupings of Programs According to Child Characteristics**

doing, it would be possible, for example, to know precisely how many center-based, home-based, combination home- and center-based, and residential programs were operating, how many handicapped and nonhandicapped children were served by each, what degree of intensity and duration of services were provided by each, as well as to know other specific information about each program with respect to curriculum use, staffing patterns, availability of other services, parent involvement, and philosophical orientation. Not only could such an administrator have an overall map of his/her programs with respect to programming trends, it would also be possible to determine gaps in current programming. For example, it would be possible to determine, if it were the case, that relatively no programs were providing residential services, that few programs were using a reverse mainstreaming program, or that, cumulatively, programs tended to not provide comprehensive services to children and families. Such information may be very useful in determining subsequent allocations of funds, as well as be useful to referral agencies which need precise information about what programs provide which services.

The information yielded by the EIPI can also help such a state coordinator to classify programs according to key programming ingredients which could then result in groups of programs for which cost-effectiveness comparisons could be made. For example, a state coordinator may find it useful to know if home-based programs providing low comprehensiveness of service to a set of children with severe language impairments is more cost-effective than center-based programs which provide moderate comprehensiveness of services to the same type of population. Additionally, a state coordinator may find it useful to know whether high intensity programs serving mildly and moderately handicapped children were more cost-effective than lower intensity programs. Such information may be very useful in subsequent planning of new programs as well as in determining what ingredients new programs should or should not be included in future endeavors.

Thus, the results of the main fieldtesting of the EIPI indicate that, although still in formative stages, it will be an efficient, simple to use and useful system for those individuals or agencies interested in knowing and monitoring current programming practices, identifying gaps in current practices, and/or conducting cost-effectiveness comparisons of different groups of existing programs to determine what program ingredients service providers should be encouraged to include as future programs are developed or as existing programs are adapted to better meet the needs of those they serve.

V. ADVISORY COMMITTEE

The advisory committee has been very active in providing feedback on project activities during the year. This feedback has occurred during the annual advisory committee meeting as well as during individual consultations at other times during the year. The formal Advisory Committee meeting was held in Utah on January 22 and 23, 1987. The agenda included discussion of sites, assessment issues, treatment verification, cost analysis issues, and the program description and evaluation system as described below.

Discussion of Sites

Materials describing each site had been sent previously to the advisory committee members. The EIRI staff member responsible for each site presented an overview of the study, updated the advisory committee about the current status, and highlighted those issues which might have implications for how the research is being conducted in other sites or for the field at large (e.g., a particular assessment technique, an innovative way of identifying children in need of services, a particular approach to intervention services). Questions were entertained about each site as appropriate, and discussion about a variety of issues emerged. Those issues which are most generalizable are summarized below.

- It was suggested that the way we think about the present information about each of the sites may be tied too closely to the language used in the RFP. Obviously, we will continue to be bound by the requirements of the RFP, but there appears to be an implicit conceptual framework which needs to be more explicit so that it will be more likely to influence decisions about treatment verification, selection of assessment instruments, cost analyses, etc. Obviously, the studies are addressing a wide range of very important issues that are sometimes addressed across studies and sometimes within studies. Issues do not always fall into three neat mutually exclusive options or categories as implied by the RFP. Indeed, any one study will provide information relevant to a number of different issues that often cut across options.

- It was recommended that the studies be presented as investigation of alternative forms of early intervention to defuse the idea that this project will be the last set of early intervention efficacy studies needed. In other words, there will always be a need for more research on what type of intervention is most effective and efficient with different groups of handicapped children. These studies are not designed to address the question of whether or not we should have early intervention, but rather to provide information about what type of early intervention is best for which groups of children.

- Because some sites have been dropped and others added since our last meeting, and because some of the sites with whom we are currently working are being considered for termination, it was recommended that we develop specific criteria by which decisions would be made to terminate a site. Staff felt that the criteria about whether or not to terminate a study were often not discrete, and suggested that as an alternative to pre-specified criteria, we continue to provide consistent and frequent feedback to those sites with whom we are having difficulty. Feedback should always include specific actions and accompanying deadlines that need to be met. In those cases where difficulties continue over a long time period and deadlines are not met, the staff would make a decision to drop a site only after the entire staff had an opportunity to consider the pros and cons of continuation and termination. There was agreement that the most important issues to be considered involved the site's adherence to the requirements of the research protocol.

- Advisory committee members made observations and suggestions about a wide range of topics including the value of ethnographic studies (i.e., the use of ethnography to document the process by which a site is terminated and the factors that lead to difficulties in conducting field-based research), whether there was sufficient statistical power in the various studies and how power considerations interact with the heterogeneity of the population, the fact that children may make progress in different areas, the need to continue enrollment in several of the studies over a longer time period in order to increase the sample sizes, and the need to ensure that the curricula being used in the various interventions were consistent with well accepted state-of-the-art interventions.

- During the course of the discussions about sites, it was discovered that the randomization procedures being used with several of the sites were being done in such a way that it was possible for service providers to influence which children were assigned to which group by the timing with which they forwarded names to USU for assignment to groups. Everyone agreed that maintaining the integrity of the randomization process was absolutely critical. In those cases where the total pool of subjects is available prior to the initiation of the services, then the procedures for randomization are clear cut. However, in those cases where children are continually enrolled in the study at a rate of two to four children per month, the process is much more complicated. It was agreed that EIRI staff would document in a detailed way the procedures used for randomization.

- Advisory committee members also discussed the degree to which children would be allowed access outside services before they should be dropped from the study. It was pointed out that in this type of field-based evaluation, we could not prohibit children from accessing services, but by documenting the amount of outside services which were accessed, we would be able to account for that to some degree in the data analysis.

Assessment Issues

Staff reviewed the procedures currently being used to recruit, train, and monitor diagnosticians in each of the sites. Segments of the training videotapes were shown, and examples of the various handouts used in training and monitoring were discussed.

- The importance of structuring the assessment situations so that children would be capable of their maximum performance was emphasized. Having diagnosticians train and practice with children from social economic and ethnic background similar to what they will be experiencing during the actual testing was stressed. Although it was agreed that testing should continue to be done by naive examiners, it is also important to structure a situation in which all children are as comfortable as possible and in which they have an opportunity to demonstrate maximum performance.

- It was suggested that EIRI staff document the specific procedures being used in each site to make sure that diagnosticians remain naive. It was pointed out that by using diagnosticians who were unaffiliated with the service program, we would solve many of the problems associated with biased testing.

- Advisory committee members commented at some length about the deficiencies with the Battelle Developmental Inventory. For example, the common perception that the Battelle was normed with handicapped children is not true. In fact, it is difficult to tell exactly who the norming population was, and the standard scores are difficult to compute and sometimes misleading. EIRI staff pointed out that they had been working with DLM publishers to obtain the actual data on which standard scores were computed, and they may be able to resolve some of those problems. Although staff members recognize and agree with the deficiencies of the Battelle, they suggested that for the purposes which it was being used (providing a broad-based measure across all 16 studies), the Battelle was still the best of currently available alternatives in spite of those deficiencies. The advisory committee agreed with this part.

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Staff presented some alternative procedures currently being considered for measuring progress of moderately to severely handicapped children. Using videotaped techniques, staff have pilot tested and are planning to use procedures for measuring mother/child interaction, progress of severely handicapped children, and motor functioning.

- Advisory committee members discussed the pros and cons of using videotaped procedures for these purposes. The general feeling was that the proposed procedures offered an intriguing and potentially valuable way for assessing progress attributable to early intervention programs for moderately to severely handicapped children. However, videotaping is a technology in which it is easy to over invest. The difficulties of a micro-analytic technique and

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- It was noted that 10 to 15 minutes represents an incredibly small sample on which to base judgments about the interactions of two human beings. There was general support for the idea of pursuing videotaped assessments of mother/child interactions, but definite caution that we not over invest.

- The idea of using videotape assessments to examine progress of severely handicapped children or of motor functioning was more positively received, but not without concerns from some advisory committee members. It was suggested that in scoring these types of videotapes, the audio portion be deleted. It was also noted that it may be possible to conceal the identity of the child so that the rating could be a matter of selecting in which videotape (pretest or posttest) the child demonstrated the most advanced skills. Ideas of reversing the image or other ways to conceal the child's identity were discussed. It was also noted that in some cases, it may be possible to match similar goals that had been selected for children in the different groups so that we would not have the problem of rating progress in completely different areas. It was pointed out that we would obviously have to select goals prior to random assignment to groups for the process to be valid.

Treatment Verification

Staff presented the techniques and materials that have been developed and implemented to verify the degree of treatment implementation in the various sites.

- Advisory committee members were supportive of what had been done so far and seemed to think that the proposed treatment verification techniques would yield useful information in terms of monitoring treatment implementation and accounting in the data analyses for differences in the way children and families participate in the interventions.

- Much of the discussion focused on the use of external onsite evaluators as part of the treatment verification plan. If such an onsite evaluation is to be used as a part of the plan, it was noted that we need to get staff and administrators of the sites involved in the conduct of the evaluation so they do not feel powerless in terms of what came out of it.

- Some advisory committee members were concerned about whether we could do external validation and evaluation for technical assistance at the same time because they believed that there was an inherent conflict in the two objectives. Others believed that more would be gained by using less precise criteria and allowing external onsite evaluators to do a more global assessment of the project.

- Questions were raised about how the information would be used and whether we would be in a position to deliver technical assistance to those sites who needed it based on the results of the evaluation. Furthermore, in those sites where it was determined that further technical assistance was needed, there were concerns that we might be altering the type of treatment provided to the degree that it would make interpretation of the study results difficult.

- Advisory committee members seemed to be positive about the general idea of external onsite visits, but felt that it was of insufficient value to justify doing it. In general, they felt that a careful onsite evaluation conducted by EIRI staff would accomplish all of the valuable parts and would avoid the unpredictable or even dangerous aspects of this type of an external onsite evaluation.

Cost Analysis Issues

Institute staff presented the rationale for including cost analysis as a part of each study and explained the different ways in which cost data would be used. A specific example of a cost study conducted last year at the institute demonstrated the types of data that would be collected and how these data would then be summarized to address issues of cost-effectiveness and cost benefit.

- Advisory committee members were very supportive of including cost data as a part of each study. Some believed that the biggest value would be in documenting the costs of various programs and the increased understanding about what services are actually delivered as a part of various programs. Some pointed out that an economic evaluation forces a philosophical explication of why a program is doing what it is doing. They emphasized that attention to this underlying theoretical motivation behind each program should be included in the report of each study.

- There was extensive discussion about how to represent the use of volunteers or parents in programs. In other words, do parent contributions represent a cost to society or a benefit to the parents? In addition, issues of how to value a parent's time in those cases where it is considered a cost of the program were discussed. Institute staff outlined the rationale for valuing parent contributions of the cost of the program and showed how the concerns of the advisory committee could be handled by presenting the results according to the different assumptions and determining whether the overall outcome changed depending on which assumptions were made.

- There was concern on the part of some advisory committee members as to whether it was really possible to place a monetary value on many of the benefits generated by early intervention programs. By trying to place a monetary value on program outcomes, we might inadvertently minimize those outcomes which are not so readily convertible to a dollar value. If that were done, public officials might misuse the results of cost analysis studies, and the field of early intervention might be damaged.

- Some advisory committee members felt that with the passage of PL 99-457, it would be appropriate for the institute to only report cost data for each program and to avoid any effort to value the benefits of early intervention.

- There was general agreement that the procedures being used by the institute for collecting cost data were at the appropriate level of detail and should provide usable information about program costs.

Program Description and Evaluation System

The rationale and objectives for the Early Intervention Program Inventory EIPI (what is known as Option 4 in the RFP) were presented and discussed. Draft materials for collecting information to provide program description were reviewed and advisory committee members were invited to provide specific feedback about the materials at a later date. The idea of using something like the ABILITIES system to provide additional information about the type of children enrolled in each project was discussed. Institute staff presented data showing the interrater and test/retest reliability for a group of 36 children. In addition, data were presented for the correlation between Battelle scores and ratings on the ABILITIES system.

- Although it was agreed that the ABILITIES system seemed to be providing accurate information, there was not a strong consensus that the information was particularly useful. As an adjunct to other child description information, it may be useful but certainly not as a stand-alone system.
- There was consensus that the procedures for collecting program description information was at about the right level of detail, and would yield useful information.

Follow-Up Activities to Advisory Committee Suggestions

EIRI staff identified 12 specific tasks to address as a follow-up of the committee meeting. These tasks are listed next, followed by specific actions taken.

1. Delineate the conceptual framework which is driving the organization and conduct of the 16 studies. This conceptual framework should focus on the central issues that are being addressed by each of the studies individually and collectively, recognizing that different studies will provide different types of information about the central issues. As a part of the conceptual framework, it is important to outline the limitations and weaknesses of each study as well as the strengths.

   A paper has been prepared detailing the conceptual framework which drives the organization and conduct of the 16 studies. The paper presents an exposition of family systems theory and its implications for the design and conduct of the 16 studies. In addition, the current site descriptions provide a more detailed rationale for each study.

2. Pursue the possibility of securing additional funding or outside collaboration to conduct ethnographic studies and eco-behavioral observations.

   The institute is actively pursuing collaborative studies with experts from these two areas. Contacts have been made with Judy Carta, Charles Greenwood, and David Lancy. Also, arrangements have been made in the New York parent involvement study to conduct some in-depth interviews with parents and intervenors. A proposal has been submitted to NIDRR to incorporate ethnographic or naturalistic inquiry techniques into the Phoenix study, and a similar proposal is being prepared for submission to NICHD.

3. Contact Louis Holmes at Brigham and Children's Hospital in Boston about the six-state project on the use of information from birth certificates.

   Contact was made with Louis Holmes, but he did not feel that their project was relevant to our needs. Based on a pilot study with one site, EIRI staff are now routinely collecting birth certificate information at over half of the other sites.

4. Provide a detailed summary of the exact procedures being used to randomly assign subjects in each group.

   Detailed summaries of the exact procedures used to randomly assign subjects at each site were reviewed with key advisory committee members and appear as part of the site descriptions contained in this report.

5. Provide a detailed summary of the procedures being used in each site to maintain naive diagnosticians.

   A detailed summary of the procedures being used to train and maintain naive diagnosticians appear in the site descriptions. In nearly every case, diagnosticians are not affiliated with the service delivery program

6. If it is impossible to obtain the standardization data for the Battelle Developmental Inventory, use linear extrapolation methods to establish new standard scores for each month within the current range of ages.

   As yet, it has not been possible to obtain the standardization data. The use of raw scores in the analysis eliminates most of this problem.

7. Delete the audio portion from the videotapes of motor and severely handicapped functioning.

   For certain scoring purposes, the audio portion has been deleted. For parent-child interaction scoring, the audio has been retained.

8. Explicitly involve site personnel in the process of external onsite evaluations so they will have a stake in the outcome.

   Each site is now being actively involved in the site review process. Twelve sites have had formal reviews, the other six reviews have been scheduled.

9. Make the research protocol for each site explicit and keep a running log of ways in which exceptions were made to that protocol.

   The research protocol has been made explicit in the form of expanded site descriptions which appear in the report. Site coordinators maintain a detailed record of any departures from this protocol.

10. Follow-up with Diane Bricker about what is being done with the BDI in terms of overcoming some of deficits which she identified with the BDI.

Contact has been made with Diane Bricker as a part of ongoing efforts to remain abreast of developments with the BDI.

11. Follow-up on the feasibility of including an assessment of family coping strategies in selected sites.

    The institute will include an assessment of family coping strategies at selected sites. The techniques for doing this will be pilot tested at the New York site.

12. Do power calculations for each of the sites. This information may be useful in convincing SEP to continue program enrollment over a longer period of time.

    The power estimates are being used to drive subject enrollment. It has been necessary to extend enrollment at a few sites.

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APPENDICES

APPENDIX I

Dissemination Activities

Graduate Students

Developmental Center for Handicapped Persons

Utah State University
Logan, Utah 84322-6870
Phone: 801-750-1172

Work reported in publications listed in this brochure was carried out in part with funds from the U.S. Department of Education (Contract #s 300-82-0367 and 300-85-0173) to the Early Intervention Research Institute at Utah State University.

PUBLICATIONS of the EARLY INTERVENTION RESEARCH INSTITUTE

Developmental Center for Handicapped Persons
Utah State University

EARLY INTERVENTION RESEARCH INSTITUTE

What is EIRI?

Funded since 1982 by a variety of state, federal, and private contracts, the Early Intervention Research Institute at Utah State University is conducting research about the impact of early intervention programs for handicapped and at-risk children and their families. **Research is conducted in three broad areas:**

- Prospective studies of the efficacy of early intervention programs including the investigation of intervention attributes and child and family characteristics which are associated with or contribute to effectiveness;
- Cost-effectiveness and cost-benefit analyses of various types of early intervention programs;
- Integrative analyses of early intervention efficacy research studies conducted by other researchers.

Information resulting from EIRI's work in these areas is distributed for the cost of reproduction to interested people. Published articles and manuscripts currently available are described briefly below. Alternative sources of availability are noted where applicable.

Publications:

1. **Relationships of language intervention efficacy to selected pretreatment subject characteristics in mentally retarded and language disordered children.**
   (Arnold, K. S., Myette, B., & Casto, G.)
   Forty-four studies of language intervention efficacy with handicapped children were examined to determine the effectiveness of such programs and whether subject and study characteristics covaried with effects. It was concluded that such interventions produce positive effects. Children with neurological involvement make less progress. *(Education and Training of the Mentally Retarded, 1986, 108-116).*

   Cost: $1.00

2. **Establishing a philosophical framework for programs for young children.**
   (Austin, A. M.)
   Five theoretical approaches to early childhood education are outlined. The goals and objectives of each approach as well as the curriculum content and the roles of the teacher and the child within each framework are discussed. *(Unpublished manuscript, 17 pages).*

   Cost: $2.00

3. **Concerns of child care administrators as modified by education, experience, and ownership of facility.**
   (Austin, A. M., & Morrow, S. C.)
   A survey of 200 child program directors asked them to identify primary problem areas. Frequently-cited problems included: Evaluating personal effectiveness as administrators; developing a philosophy of goals and objectives for their programs; evaluating program effectiveness for the child, and establishing effective parent-center communication. *(Educational Research Quarterly, 1985-86, 10, 25-30).*

   Cost: $1.00

4. **Gender and developmental differences in children's conversations.**
   (Austin, A., Salehi, M., & Leffler, A.)
   Extending work on childhood gender differences by Block (1982) and Block (1983), the present research investigated assimilative and accommodative discourse devices in the speech of 24 preschool children (12 boys and 12 girls) and 24 middle-childhood youngsters (12 boys and 12 girls) in each of grades 3 and 6. *(Sex Roles, in press, 13 pages)*

   Cost: $1.50

5. **Benefit-cost analysis of the Perry Preschool Program and its policy implications.**
   (Barnett, W. S.)
   This paper presents the benefit-cost analysis of the Perry Preschool Program and its long-term effects and examines the basis for U.S. public policy decisions regarding early childhood education. It concludes that the Perry Preschool study provides support for public programs for children but does not generalize to all handicapped preschoolers, nor does it address the issue of universal preschool education. Implications for research and policy are suggested. *(Educational Evaluation and Policy Analysis, 1985, 7, 333-342).*

   Cost: $1.00

6. **Methodological issues in economic evaluation of early intervention programs.**
   (Barnett, W. S.)
   The application of various techniques of economic evaluation to early intervention has attracted considerable attention from policy makers, practitioners, and researchers interested in programs that seek to improve the development of infants and young children. Economic evaluation has made some outstanding contributions to the field's knowledge of early intervention. This paper provides an overview of economic evaluation and reviews three of the best-known examples. *(Early Childhood Research Quarterly, 1986, 1, 249-268).*

   Cost: $2:00

7. **Definition and classification of mental retardation: A reply to Zigler, Balla, and Hodapp.**
(Barnett, W. S.)
A conceptual framework for definition of mental retardation is proposed and used to evaluate the merits of IQ and social competence in determining mental retardation. The use of IQ alone is judged to be inappropriate and potentially harmful when applied to individuals and when used to formulate public policy. Classification systems for mental retardation are appraised, and evidence is presented that our knowledge is insufficient to attribute genetic or organic etiology to most mental retardation. *(American Journal of Mental Deficiency, 1986, 91, 111-116).*
Cost: $1.00

8. **Economic evaluation of early intervention.**
(Barnett, W. S., & Escobar, C. M.)
This paper critically reviews and examines the internal validity and generalizability of economic evaluations of early intervention programs. While there are a few studies which provide dependable findings for early intervention with disadvantaged children, the review reveals the clear need for further economic research on early intervention, especially with regard to its long-term benefits, programs for handicapped children, and new models of intervention. *(Unpublished manuscript, 53 pages).*
Cost: $5.00

9. **The economics of early intervention for handicapped children: What do we really know?**
(Barnett, W. S., & Escobar, C. M.)
Empirical studies of the costs and effects or benefits of early interventions with handicapped children were reviewed. Fifteen studies were identified. Their validity and generalizability were assessed based on their designs, statistical analyses, and economic methods. It was found that the literature provides much less information regarding the economics of early intervention than is commonly believed. Suggestions are made for future research. *(Unpublished manuscript, 25 pages).*
Cost: $2.00

10. **Parent and clinic early intervention for children with language handicaps: A cost-effectiveness analysis.**
(Barnett, W. S., Escobar, C. M., & Ravsten, M.)
The relative economic efficiency of home-based intervention, clinic-based intervention, and a combination of both center- and home-based for 40 language-impaired preschoolers is investigated. The outcome of the experimental study suggests the need for future research into the potential of parent-delivered services as an effective, low-cost alternative to center-based services. *(Unpublished manuscript, 26 pages).*
Cost: $2.50

11. **Cost-effectiveness analysis for state and local decision making: An application to half-day and full-day preschool special education programs.**
(Barnett, W. S., & Pezzino, J.)
Policy makers at both the state and local levels often must make decisions regarding educational programs for which existing research provides little guidance. In such cases, local program data can be obtained at relatively low cost and typically is viewed as more relevant than data from another state. This paper illustrates the use of local data to examine cost and effectiveness for a decision in which both are important considerations. *(Journal of the Division for Early Childhood, 1986, 11, 90-100).*
Cost: $1.00

12. **A treatment program for pregnant adolescents and their infants.**
(Bell, C., Casto, Y., & Casto, G.)
A structured treatment program for pregnant adolescents and their at-risk infants is described. Research data collected for the program suggest that it produces substantial immediate effects and produces cost savings by breaking the cycle of improper parenting, child abuse, and neglect. Suggestions for further research are given. *(In R. Feldman & A. Stiffman [Eds.], Advances in adolescent mental health, 1986, pp. 37-46, Greenwich, CT: JAI Press).*
Cost: $2.00

13. **Concurrent validity of the Battelle Developmental Inventory: Relationship with the Bayley Scales in young children with known or suspected disability.**
(Boyd, R. D., Welge, P., Sexton, D., & Miller, J. H.).
The concurrent validity of the Battelle Developmental Inventory was explored by correlating Battelle results with scores of the Bayley. Both pattern and strength of the correlations lend support to the Battelle as an appropriate measure. *(Unpublished manuscript, 21 pages).*
Cost: $2.00

14. **The efficacy of early intervention programs for handicapped children: A meta-analysis.**
(Casto, G., & Mastropieri, M. A.)
A meta-analysis of primary research studies investigating early intervention efficacy with handicapped preschoolers indicates that early intervention was effective with handicapped populations and longer, more intensive programs were associated with efficacy. Little support for the importance of age at start and parental involvement was found. Implications for future research are discussed. *(Exceptional Children, 1986, 52, 417-424).*
Cost: $1.00

15. **A counter-interpretation of early intervention effects: A response to Casto and Mastropieri.**
(Strain, P. S., & Smith, B. J.)
This rebuttal to the Casto and Mastropieri (1986) article comments on the authors' use of meta-analysis, questions the conclusions regarding age at start and parent involvement, and considers the general question of early intervention effects as they relate to policy and program planning. *(Exceptional Children, 1986, 53, 260-265).*
Cost: $1.00

16. **Strain and Smith do protest too much: A reply.**
(Casto, G., & Mastropieri, M.)
Strain and Smith (1986) propose a counter interpretation of the findings reported in the Casto and Mastropieri (1986) article. This article responds to the Strain and Smith critique and provides additional evidence which supports the original findings. *(Exceptional Children, 1986, 53, 266-268).*
Cost: $.50

17. **A critique of the Utah State University early intervention meta-analysis research.**
(Dunst, C. J., & Snyder, S. W.)
This article characterizes the EIRI meta-analysis efforts as being so fraught with conceptual, methodological, statistiical, and procedural problems that fundamentally uninterpretable results are yielded. The article attempts to provide support for this assertion. *(Exceptional Children, 1986, 53, 269-276).*
Cost: $1.00

18. **Much ado about nothing: A reply to Dunst and Snyder.**
(Casto, G., & Mastropieri, M. A.)
Dunst and Snyder attempted to point out the methodological and other shortcomings of the EIRI meta-analysis of the early intervention research literature. This article responds to their criticisms and points out the flaws in their critique. *(Exceptional Children, 1986, 53, 277-279).*
Cost: $.50

19. **Plasticity and the handicapped child: A review of efficacy research.**
(Casto, G.)
Intervention is but one event in a series of critical events in the lives of handicapped children. Based on a review of existing early intervention efficacy research, this paper argues that a psychobiological model provides a good explanation of the effects of early intervention programs. *(In J. Gallagher & C. Ramey [Eds.], Plasticity in development, 1987, Baltimore; MD: Brookes Publishing, 14 pages).*
Cost: $1.50

20. **Research and program evaluation in early childhood special education.**
(Casto, G.)
This chapter emphasizes the importance of research and program evaluation in the field of Early Childhood Special Education. After distinguishing between basic and applied research and program evaluation, the chapter discusses design issues, data collection, treatment implementation, and ethical considerations. *(In S. Odom & M. Karnes [Eds.], Research and program evaluation in early childhood special education, in press, 15 pages).*
Cost: $1.50

21. **Common outreach indicators.**
(Casto, G.)
A presentation of a newly developed early intervention outreach impact indicator system describes the major impact areas and gives examples of data collected by outreach projects. While indicators are not exhaustive, they allow for the collection and reporting of comparable data across outreach projects and provide a data base for future planning. *(Monograph of the Technical Assistance Development System, 1985, Chapel Hill, NC, 10 pages).*
Cost: $1.00

22. **The relationship between program intensity and duration and efficacy of early intervention.**
(Casto, G.)
A meta-analysis of the relationship between program intensity/duration and efficacy in early intervention suggests that the degree of the program intensity is related to early intervention effectiveness for handicapped populations. For disadvantaged populations, the data are less clear. *(Unpublished manuscript, 20 pages).*
Cost: $2.00

23. **Selecting outcome measures in early intervention.**
(Casto, G., & Lewis, A.)
An analysis of outcome measures selected to document the effectiveness of early intervention programs suggests that both researchers and practitioners have often failed to relate outcome measures to program objectives, have used inappropriate instruments, and have failed to link a child's status at the end of intervention with his/her future developmental status. Specific guidelines for selecting appropriate outcome measures are given. *(Journal of the Division for Early Childhood, 1986, 10, 118-123).*
Cost: $1.00

24. **Early intervention efficacy research: Separating fact from fiction.**
(Casto, G.)
This article presents the findings from previous reviews of efficacy research, the findings from the EIRI integrative review, the findings from single subject studies, and attempts to reconcile the diverse findings. *(Topics in Early Childhood Special Education, in press, 13 pages).*
Cost: $1.50

25. **Family assessment.**
(Casto, G.)
Traditionally, research and program evaluation efforts in early intervention have focused on developmental changes in children while somewhat ignoring the impacts of such programs on families. This paper stresses the importance of collecting family outcome measures and suggests some strategies. *(DEC Communicator, 1986, 12(3), 1-2).*
Cost: $1.00

26. **Current perspectives in infancy and early childhood research.**
(Casto, G., Ascione, F., & Salehi, M. [Eds.])
The Institute sponsors a yearly conference on current research in infancy and early childhood. This monograph consists of the major papers presented at the 1986 conference and includes papers by Victor Denenberg, Evelyn Thoman, Glendon Casto, Michael Lewis, Artin Goncu, and Sam Meisels. *(Logan, UT: Utah State University, Early Intervention Research Institute Press, 1987, 90 pages).*
Cost: $ 9.00

27. **The efficacy of early intervention programs for low birth weight infants.**
(Casto, G., Gaynard, L., Mobasher, H., Chan, G., Dolcourt, J., Levkoff, A., & Saylor, C.)
Early intervention with low birthweight infants began some years ago. This paper reports an integrative review of all intervention studies with low birth weight infants which could be located. After reporting intervention results, suggestions for improving intervention studies with low birth weight infants are given. *(In G. Casto, F. Ascione, & M. Salehi [Eds.], Current perspectives in infancy and early childhood research, 1987, Logan, UT: Utah State University, Early Intervention Research Institute Press, 15 pages.)*
Cost: $1.50

28. **A comparative analysis of head start efficacy research.**
(Casto, G., Mitchell, H., & Corey, W.)
This article compares the findings of the Head Start Synthesis and Evaluation project (Hubbell-McKey et al.) with the findings of EIRI's integrative review. The findings of the two analyses serve as a basis for comments on various aspects of the Schweinhart, Weikart (1986) critique of the synthesis study. *(Unpublished manuscript, 20 pages).*
Cost: $2.00

29. **Early intervention for preschoolers with Down syndrome: A review.**
(Casto, G., Tingey-Michaelis, C., & Crutcher, D.)
Although there is a rich literature related to Down syndrome, high-quality efficacy studies with preschoolers with Down syndrome are very few. This article reports the findings from 15 efficacy studies which dealt with this population. *(Unpublished manuscript, 20 pages).*
Cost: $2.00

30. **A planning process for recruiting and retaining early intervention personnel in rural areas.**
(Casto, G., & Lewis, A.)
A planning guide for use by agencies which need to recruit and retain personnel to deliver services to early intervention programs describes a process for recruitment and retention. *(Monograph of the Rural Network, 1985. Western Illinois University Press, 17 pages).*
Cost: $2.00

31. **Parent involvement in infant and preschool programs.**
(Casto, G., & Lewis, A.)
A meta-analysis of parent involvement in early intervention programs for disadvantaged, at-risk, and handicapped preschoolers demonstrates that there is little empirical data to either support or refute the position that parental involvement leads to more effective intervention programs. Suggestions for future research which addresses the efficacy of parental involvement with handicapped children are included. *(Journal of the Division for Early Childhood, 1984, 9, 49-56).*
Cost: $1.00

32. **Early intervention: Is earlier better?**
(Casto, G., & Lewis, A.)
An analytic review of the importance of age at start in early intervention programs provides almost no empirical support for the assertion that preschoolers who start intervention earlier do better in intervention programs. Possible reasons for the contradictory findings and suggestions for future research are discussed. *(Unpublished manuscript, 22 pages.)*
Cost: $2.00

33. **The efficacy of early intervention programs with environmentally at-risk infants.**
(Casto, G., & White, K. R.)
The results of 70 early intervention efficacy studies with at-risk infants were quantitatively analyzed and summarized. Results suggest that infant intervention programs have substantial immediate effects, but little empirical evidence exists to confirm or refute commonly held opinions about important concomitants of intervention effectiveness. *(Journal of Children in Contemporary Society, 1984, 17, 37-48).*

Cost: $1.00

34. **An Early Intervention Research Institute: Efficacy and cost studies in early intervention.**
(Casto, G., White, K. R., & Taylor, C.)
The mission and objectives of the Early Intervention Research Institute are described. The rationale, procedures, and expected results of the Institute's first year's workscope are summarized. *(Journal of the Division for Early Childhood, 1983, 7, 5-17).*

Cost: $1.50

35. **Using the Minnesota Child Developent Inventory as a measure of developmental progress with handicapped children.**
(DeAyora, P., & White, K. R.)
The reliability and concurrent validity of the Minnesota Child Development Inventory (MCDI) as a measure of developmental functioning with handicapped children was investigated. Although the MCDI is not as strong psychometrically as other standardized measures of developmental functioning, results were moderately encouraging, given the ease and economy with which MCDI can be administered. *(Journal of Psychoeducational Assessment, in press, 19 pages).*

Cost: $2.00

36. **Early stimulation and brain organization in the rat.**
(Denenberg, V.)
The question of the effects of early experience upon later behavioral and biological processes is addressed in this paper. Specifically, this paper reviews findings concerning early experience and brain laterality in the rat and shows how the data can be fitted into a simplified model of the brain. *(In G. Casto, F. Ascione, & M. Salehi [Ed.], Current perspectives in infancy and early childhood research, 1987, Logan, UT: Early Intervention Research Institute, Utah State University, 15 pages).*

Cost: $1.50

37. **Contingent valuation of an early intervention program for handicapped preschoolers.**
(Escobar, C. M., Barnett, W. S., & Keith, J. E.)
This paper provides a framework for estimating the benefits of early intervention programs to parents of handicapped preschool children. Based upon a survey of 83 parents, which elicited their willingness to pay for the program, results indicated a significant private valuation of the program. *(Unpublished manuscript, 15 pages).*

Cost: $1.50

38. **The role of adults and peers in the socialization of play during preschool years.**
(Goncu, A.)
Play is an important aspect of children's socialization wherein children acquire culturally acceptable cognitive and social skills by interacting with adults and peers. This paper describes the process by which adults and older peers contribute to preschoolers' acquisition of communication strategies about play. *(In G. Casto, F. Ascione, & M. Salehi [Ed.], Current perspectives in infancy and early childhood research, 1987, Logan, UT: Early Intervention Research Institute, Utah State University, 14 pages).*

Cost: $1.50

39. **The research of Harold Skeels: Contributions to psychology and early education.**
(Goodrich, G.)
A review of the research contributions of Harold Skeels to psychology and early education describes his experiments with IQs and the effects of adult attention on functionally retarded preschool orphan children. The impact of Skeels on compensatory education is discussed. *(Unpublished manuscript, 15 pages).*

Cost: $1.50

40. **The efficacy of preventive intervention: A glass half full?**
(Greenspan, S. I., & White, K. R.)
Research on the efficacy of early intervention is reviewed with particular attention to the types of programs which have been employed most frequently. Because so few programs have been comprehensive in either the types of interventions implemented or the outcomes assessed, it is argued that we should be encouraged instead of discouraged by the modest success which has been demonstrated. *(Zero to Three, 1985, 5, 1-5).*

Cost: $.50

41. **Conducting research with preventive intervention programs.**
(Greenspan, S. I., & White, K. R.)
Methodological and procedural lessons learned from an analysis of past early intervention efficacy research are summarized. Particular attention is given to selecting assessment measures, the design and analysis of research studies, and the need to test the effectiveness of comprehensive intervention programs. *(In I. F. Berlin & J. Noshpitz [Eds.], Basic handbook of child psychiatry, in press. New York: Basic Books, 28 pages).*
Cost: $3.00

42. **Children's attention as a measure of central nervous system integrity.**
(Lewis, M., & Hadzimichalis, D.)
Visual attention as a measure of cognitive integrity has received considerable attention in recent years. This paper proposes a system for assessing sustained attention in infants and attests to its importance in both research and clinical practice. *(In G. Casto, F. Ascione, & M. Salehi [Ed.], Current perspectives in infancy and early childhood research, 1987, Logan, UT: Early Intervention Research Institute, Utah State University, 16 pages).*
Cost: $1.50

43. **Age at start as a correlate of early intervention.**
(Mastropieri, M. A.)
This study examines the age at start and early intervention effectiveness of 625 children who had been enrolled in the Western Carolina Infant Program for one to several years. Correlational analysis suggested that no significant difference existed for those children who started intervention earlier. Suggestions for future research are given. *(Psychology in the Schools, 1987, 6 pages)*
Cost: $1.00

44. **Early intervention for behaviorally disordered children: An integrative review.**
(Mastropieri, M. A., Scruggs, T. E., & Casto, G.)
A meta-analysis of research studies on early intervention programs for behaviorally disordered children demonstrates that early intervention efforts have been effective for behaviorally disordered children. Impact of intervention appeared to be strongest for pharmocotherapy and modeling studies, and weakest for theraputic nurseries. Implications for future research are suggested. *(Monograph in Behavioral Disorders, 1985, 8, 27-35).*
Cost: $1.00

45. **The accuracy of introductory special education texts with regard to early intervention.**
(Mastropieri, M. A., White, K. R., & Fecteau, F.)
The most frequent conclusions concerning the efficacy of early intervention from commonly used introductory special education textbooks are summarized. Although these conclusions are consistent with the "prevailing wisdom" in the field, in many cases there is little empirical support for these positions. *(Journal of the Division for Early Childhood, 1986, 11, 59-66).*
Cost: $1.00

46. **Parent tutoring as a supplement to compensatory education for first grade children.**
(Mehren, M., & White, K. R.)
A randomized study of children identified as being at risk for reading failure at the end of the kindergarten year was conducted to determine the effects of using parents to tutor their child. For those parents who participated, the program was very successful, but a large number of parents failed to implement the program inspite of extensive support. *(Unpublished manuscript, 29 pages).*
Cost: $3.00

47. **Using criterion referenced assessment data to measure the progress of handicapped children in early intervention programs.**
(Meisels, S.)
This paper reviews the underlying structure of early childhood assessment devices, distinguishes between norm-referenced and criterion-referenced instruments, and describes how the data from criterion-referenced instruments can be used to measure child progress. *(In G. Casto, F. Ascione, & M. Salehi [Ed.], Current perspectives in infancy and early childhood research, 1987, Logan, UT: Early Intervention Research Institute, Utah State University, 14 pages).*
Cost: $1.50

48. **Concurrent validity of the Battelle Developmental Inventory for speech and language disordered children.**
(Mott, S. E.)
Concurrent validity of the Battelle Developmental Inventory (BDI) was investigated with speech and language disordered children between the ages of 35 and 60 months. Correlations between the BDI and the Peabody Picture Vocabulary Test-Revised (PPVT-R), Preschool Language Scale (PLS), and Arizona Articulation Proficiency Scale (AAPS) were calculated. *(Unpublished manuscript, 15 pages).*
Cost: $1.50

49. **Annotated bibliography of self-report measures of family functioning.**
(Mott, S. E., & Casto, G.)
Emphasis on family involvement in early intervention programs requires the identification of assessment instruments which are appropriate for evaluating family outcomes. This paper was developed in order to provide practitioners with information about one specific area of family functioning assessment--self-report measures. Twenty-five measures are described in terms of content, format, and reliability and validity. Sources for obtaining the measures are also cited. *(Unpublished manuscript, 38 pages).*

Cost: $4.00

50. **Measuring child and family outcomes in early childhood special education: Some reviews from the field.**
(Mott, S. E., Fewell, R., Lewis, M., Meisels, S., Shonkoff, J., & Simeonsson, R.)
At a conference sponsored by EIRI, five early childhood assessment specialists were asked to propose the best existing measure of child functioning and the best existing measure of family functioning for use in measuring the outcomes of early intervention programs. This paper summarizes the presentations made by each of the experts. *(Topics in Early Childhood Special Education, 1986, 6, 1-15).*

Cost: $1.50

51. **Improving pre-academic skills in developmentally delayed preschoolers through use of a highly structured cognitive intervention program.**
(Peterson, A., Casto, G., & Lindauer, S. L.)
This study compared the effectiveness of a highly structured cognitive preschool intervention program to a less highly structured intervention. Following a four-month intervention period, children in the high structure group made significantly higher gains on cognitive assessment instruments. *(Unpublished manuscript, 18 pages).*

Cost: $2.00

52. **A critical review: Cost-effectiveness analysis in human service research.**
(Pezzino, J.)
This survey reports findings of selected cost-effectiveness analyses in human services research and critiques primary research based on essential criteria. Results indicated that only a small percentage of social programs' research efforts consider the cost component. The few studies that have been conducted lack one or more essential criteria for comprehensive cost-effectiveness analysis. *(Paper presented at the Fourth Annual Montana Symposium on Early Education and the Exceptional Child, Billings, MT, 18 pages).*

Cost: $2.00

53. **Concurrent validity of the Battelle Developmental Inventory.**
(Pezzino, J., Mott, S. E., & Waidler, J.)
The Battelle Developmental Inventory (BDI) appears promising as an early childhood assessment device; however, little data are currently available on its use with moderately to severely handicapped preschoolers. In this study, measures of cognitive, language, and general developmental functioning were administered to 52 handicapped children between three and five years of age to assess the concurrent validity of the BDI. Additionally, strengths and weaknesses of the BDI are discussed. *(Unpublished manuscript, 20 pages).*

Cost: $2.00

54. **New perspectives on Down syndrome**
(Pueschel, S. M., Tingey-Michaelis, C., Rynders, J., Crocker, A., & Crutcher, D. [Eds.])
Biomedical, educational, psychosocial, and community living issues associated with Down syndrome are discussed in chapters written by invited presenters to a federally funded State-of-the-Art conference. Material includes discussions of etiology, genetics, developmental intervention, and family concerns. (Available from Brooks Publishing, Baltimore, MD, 1986).

55. **Parental involvement in early intervention: A review and critique.**
(Reeder, D., & Casto, G.)
A review of the research on parent involvement in early intervention discusses the conflicting findings of those studies which have made direct comparisons of different levels of parental involvement and suggests approaches to improve the quality of parent involvement research. *(Unpublished manuscript, 21 pages).*

Cost: $2.00

56. **Mothers' perceptions of their children's supplemental care experience: Correlation with spousal relationship.**
(Roopnarine, J. L., Mounts, N. S., & Casto, G.).
A survey of parents who use day care facilities for their young children was done to elicit their perceptions of their children's day care experience and its relationship to their marital relationship. *(American Journal of Orthopsychology, 1986, 56, 581-588).*

Cost: $1.00

57. **Early Intervention for socially withdrawn children: A quantitative synthesis of single-subject research.**
(Scruggs, T. E., & Mastropieri, M. A.)
Results from 18 single subject research studies about the efficacy of early intervention with socially withdrawn children is quantitatively summarized. It is concluded that such research has demonstrated the immediate effectiveness of such intervention approaches, but does not address the degree to which generalization or maintenance occurs. *(Journal of Special Education, 1985-86, 19, 429-442).*

Cost: $1.50

58. **Early Intervention for behavior disordered children: The synthesis of single subject research.**
(Scruggs, T. E., Mastropieri, M. A., & Casto, G.)
A procedure for synthesizing single subject research is presented and the results of its application to two areas of research relevant to the field of preschool behavior disorders are given: Social withdrawal and conduct disorders. *(Behavioral Disorders Monographs, 1987, 9, 10 pages).*

Cost: $1.00

59. **Quantitative synthesis of single subject research: Methodology and validation.**
(Scruggs, T. E., Mastropieri, M. A., & Casto, G.)
This article describes procedures recently employed for the quantitative synthesis of single subject research literature in special education. The need for objective, systematic, review procedures is described, previous approaches for quantitative evaluation of outcomes of single case research designs are reviewed, and a procedure was which used percent of non-overlapping data points (PND) is described using examples from recent synthesis efforts. *(Remedial and Special Education, 1987, 8[2], 22 pages).*

Cost: $2.00

60. **Some comments concerning "The quantitative synthesis of single subject research."**
(White, O. R.)
An evaluation of the percent of non-overlapping data (PND) approach for quantifying outcomes of single subject research reveals that it is potentially too sensitive to a typical baseline data and not powerful enough to discriminate important treatment differences, and may be adversely affected by even subtle trends in the data. Suggestions for correcting some of the problems are provided. *(Remedial and Special Education, 1987, 8[2], 13 pages).*

Cost: $1.50

61. **Reply to Owen White.**
(Scruggs, T. E., Mastropieri, M. A., & Casto, G.)
Owen White describes several concerns regarding the percent of non-overlapping data (PND) statistics and suggests possible alternatives for meeting these concerns. In most cases, these suggestions are based upon idealized or hypothetical data structures which are not appropriate to the application of quantitative solutions to existing literature. *(Remedial and Special Education, 1987, 8[2], 5 pages).*

Cost: $.50

62. **Meta-analysis for single subject research: When does it clarify, when does it obscure?**
(Salzberg, C., Strain, P. S., & Baer, D. M.)
Several theoretical objections to the EIRI quantitative synthesis of single subject research are presented, and the argument is made that the number of procedural variations per subject inhibits interpretability of a single outcome metric. The authors provide a qualitative review of several of the studies included in a previous quantitative synthesis as evidence of the superiority of narrative reviews and to demonstrate the need for additional information in such review procedures. *(Remedial and Special Education, 1987, 8[2], 15 pages).*

Cost: $1.50

63. **Response to Salzberg, Strain, and Baer.**
(Scruggs, T. E., Mastropieri, M. A., & Casto, G.)
Salzberg, Strain, and Baer criticize our methods for being insensitive to the complexities of single subject data and provide an example of a more traditional narrative review as a positive alternative. We restate our original position that such narrative review procedures are of limited utility, unless objective standards for evaluating study outcomes have been explicitly stated, and that without such standards, evaluation of the objectivity and replicability of the review cannot be made. *(Remedial and Special Education, 1987, 8[2], 9 pages).*

Cost: $ 1.00

64. **Early Intervention for children with conduct disorders: A quantitative synthesis of single-subject research.**
(Scruggs, T. E., Mastropieri, M.A., Cook, S. B., & Escobar, C)
To evaluate treatment of preschool children with conduct disorders, 16 studies were reviewed in which single-subject methodology was employed. Studies were coded for a number of variables describing study characteristics. Results indicated that reinforcement produced most positive outcomes, followed by punishment, timeout, and differential attention, respectively. *(Behavioral Disorders, 1986, 11, 260-271).*
Cost: $1.00

65. **Cost-effectiveness analysis of full-day versus half-day intervention programs for handicapped preschoolers.**
    (Taylor, C., White, K. R., & Pezzino, J.)
    A cost-effectiveness analysis comparing half-day versus full-day programs for handicapped preschoolers demonstrated that for this sample, half-day programs were more cost-effective for mentally retarded children. The advantages of a rigorous cost-effectiveness approach to such evaluation are summarized. *(Journal of the Division for Early Childhood, 1984, 9, 76-85).*

    Cost: $1.00

66. **The nature of the youngest humans: Babies born prematurely.**
    (Thoman, E.)
    This paper proposes a model for enriching the environment for prematurely born babies. An intervention strategy is described which permits premature infants to express a preference for specific stimulus conditions and allows them to regulate the amount of stimulation they receive. *(In G. Casto, F. Ascione, & M. Salehi [Ed.], Current perspectives in infancy and early childhood research, 1987, Logan, UT: Early Intervention Research Institute, Utah State University, 14 pages).*

    Cost: $1.50

67. **What's in an "A?"**
    (Tingey-Michaelis, C.)
    Various methods of evaluation of progress and how the purpose of the evaluation influences the comparisons made, the increments of the scale and the criteria for success is discussed. Article focuses on teacher/classroom evaluation. *(Early Years, 1986, 17[3], 85-87).*

    Cost: $ .50

68. **Psychosocial development in persons with Down syndrome.**
    (Tingey-Michaelis, C.)
    Models of development (Erickson, Piaget, & Bandura) are described and applicability of such models to individuals with Down syndrome is considered. Developmental events pertinent to psychosocial development are given and assessment methods are described. The paper is part of a publication of proceedings from 1985 State-of-the-Art Conference sponsored by the National Down Syndrome Congress and the U. S. Department of Education. *(In. S. M. Pueschel, C. Tingey-Michaelis, J. Rynders, A. Crocker, & D. Crutcher [Eds.], New Perspectives on Down Syndrome, Baltimore, MD: Brooks Publishing, 1986, pp. 311-344).*

    Cost: $2.00

69. **Early Intervention: Learning what works.**
    (Tingey-Michaelis, C.)
    The rationale for research in early intervention is presented for parents and general public. Includes brief description of the results already published and questions that need data-based answers. *(The Exceptional Parent, 1986, 16[7], 32-37).*

    Cost: $ .50

70. **Parental involvement in early intervention: Becoming a parent plus.**
    (Tingey-Michaelis, C., Boyd, R., & Casto, G.)
    Report of mini conference on parental involvement sponsored by EIRI and held during the 1986 annual Council for Exceptional Children Conference. Summary of presentations is organized into catagories of parent training to parent support. Suggestions are given for research questions and outcome measures. *(Early Child Development and Care, in press, 28[1], 10 pages).*

    Cost: $1.00

71. **Early intervention: Is certification necessary?**
    (Tingey-Michaelis, C.)
    A meta-analysis of the amount and type of training of primary intervenors in early intervention programs indicates that intervenors who were certified were significantly more effective than those who were not. Suggestions for studying intervenor characteristics and training that produce effective child gains are given. *(Teacher Education and Special Education, 1985, 8, 91-97).*

    Cost: $ .50

72. **Early intervention helps parents, too.**
    (Tingey-Michaelis, C.)
    A historical perspective, as seen from the perspective of a mother of a handicapped child who participated in one of the earliest community-based early intervention programs, is given. Suggestions to parents about what to look for in selecting an intervention program are given. *(Exceptional Parent, 16[1], 51-54).*

    Cost: $ .50

73. **The importance of structure in early education programs for disadvantaged and handicapped children.**
(Tingey-Michaelis, C.)
An analysis of early intervention efficacy research suggests that programs with preplanned goals and structured curricula produced more gains. Suggestions for further study of goal setting and evaluation for children, and training and supervision for staff necessary to implement structured programs, are given. *(Early Childhood Development and Care, 1986, 23, 10 pages).*
Cost: $1.00

74. **A longitudinal study of early intervention with hearing impaired children.**
(Watkins, S., & Casto, G.)
A longitudinal study of two groups of hearing-impaired children, one whom received intervention before 30 months of age and a second of whom received intervention after 30 months of age, is reported. Results suggested very few differences between the two groups. Results are compared with those of a meta-analysis of the early intervention efficacy research literature. *(Unpublished manuscript, 17 pages).*
Cost: $1.50

75. **Causes of academic failure among children with normal IQ. A review of S. Broman, E. Bien, and P. Shaughnessy low achieving children: The first seven years.**
(White, K. R.)
The Collaborative Perinatal Project began in 1959 and collected data on over 300 variables for over 53,000 children to determine the biomedical and sociological causes of developmental disorders. This paper reviews a book by Broman, Bien, and Shaughnessy which used a subset of the Collaborative Perinatal Project data to determine the causes of low achievement among children with low IQ. *(Contemporary Psychology, in press, 9 pages)*
Cost: $ 1.00

76. **Cost-benefit studies of primary prevention programs.**
(White, K.R.)
The historical role of research in the formation of public policy is outlined. Particular emphasis is given to early intervention programs and the way in which cost-analytical studies can be used most effectively in improving the quality and outcomes of such programs. *(Family Resource Coalition Report, 1985, 2, 4-6).*
Cost: $1.00

77. **Cost analyses in family support programs.**
(White, K. R.)
The rationale, benefits, and dangers of conducting cost analyses in family support programs are outlined. Commonly made mistakes in the fields of early intervention and other social service programs are identified and discussed, and suggestions are made about how cost analyses can most effectively contribute to the formation of public policy. *(In H. Weiss & F. Jacobs [Eds.], Evaluating family programs, in press. Hawthorne, NY: Aldine, 21 pages).*
Cost: $2.00

78. **The efficacy of early intervention.**
(White, K. R.)
The applicability of the scientific method of inquiry in synthesizing and understanding the results of previously completed research is demonstrated using an analysis of 326 studies of early intervention efficacy. Results of that analysis, including suggestions for improving the quality of future research, are summarized. *(Journal of Special Education, 1985-86, 19, 401-416)*
Cost: $1.50

79. **The role of research in formulating public policy and early intervention.**
(White, K. R.)
The role of research in formulating public policy about early intervention is summarized. It is argued that decisions about whether or not to offer such programs are usually based on other factors, and the most important role of research is to investigate what types of programs are most effective for which children. *(Paper presented to Child and Youth Research Luncheon Forum, United States Congress, 1985, November, 13 pages).*
Cost: $1.50

80. **Advocacy and science: Different and legitimate roles in the development and implementation of early intervention programs.**
(White, K. R.)
The strengths and limitations of scientific methods of inquiry and advocacy efforts in the development, implementation, and continuation of early intervention programs for at-risk and handicapped children are discussed. Although both advocacy and science have legitimate roles, it is argued that problems can arise when pseudo-scientific arguments are used by advocates. *(Keynote address, Colorado Division of Early Childhood, The Council for Exceptional Children, Greeley, CO., 1984, February, 50 pages).*
Cost: $5.00

81. **Learning from previous reviews of early intervention research.**
(White, K. R., Bush, D. W., & Casto, G.)
Over 50 previous reviews of the early intervention efficacy literature are critically analyzed. The most frequent findings of these reviews are summarized. The value of systematically examining previous reviews before initiating new research efforts is discussed. *(Journal of Special Education, 1985-86, 19, 417-428).*

Cost: $1.50

82. **An integrative review of early intervention efficacy studies with at-risk children: Implications for the handicapped.**
(White, K. R., & Casto, G)
A quantitative analysis of 162 early intervention efficacy studies with disadvantaged, at-risk, and handicapped preschoolers demonstrated substantial immediate effects for all three groups, but little data from high-quality studies exists to answer most other questions. Suggestions for future early intervention efficacy research are discussed. *(Analysis and Intervention in Developmental Disabilities, 1985, 5, 7-31).*

Cost: $2.50

83. **An analysis of special education early childhood projects approved by the Joint Dissemination Review Panel.**
(White, K. R., Mastropieri, M. A., & Casto, G.)
Twenty-one early intervention projects approved for national dissemination by the Joint Dissemination Review Panel are critically analyzed as to the magnitude of the reported effects, credibility of the results, and the implications of the studies. It is concluded that these projects have contributed significantly to the development of early intervention through the models of service provision and curricula. *(Journal of the Division for Early Childhood, 1984, 9, 11-26).*

Cost: $1.50

84. **The integration of completed research: Standards for high-quality work.**
(White, K. R., Goodrich, G., & Taylor, C.)
Standards for how to judge whether a review is of high quality are outlined, and a large number of reviews of two important issues (early intervention and the treatment of hyperactivity) are compared to these standards to draw conclusions about how to improve the most frequently used methods of research integration. *(Paper presented at the annual meeting of the Rocky Mountain Psychological Association, Snowbird, UT, 1983, April, 27 pages).*

Cost: $2.50

85. **An overview of effectiveness of preventive intervention programs.**
(White, K. R., & Greenspan, S. I.)
A quantitative analysis of 162 previous studies of early intervention efficacy demonstrates that a wide variety of intervention programs produce substantial immediate effects. However, very little empirical evidence was found to confirm or refute commonly advocated positions about age at start, training of intervenors, parent involvement, or intensity/duration of the intervention. Suggestions for future research are given. *(In I. F. Berlin & J. Noshpitz [Eds.], Basic handbook of psychiatry, in press. New York: Basic Books).*

Cost: $1.00

86. **Conducting longitudinal research about the efficacy of early intervention with handicapped children.**
(White, K. R., & Mott, S. E.)
The goals and activities of the Longitudinal Studies of the Effects and Costs of Early Intervention for Handicapped Children are described. The project is conducting 16 longitudinal randomized comparisons of various types of early intervention programs. Methodological and procedural safeguards which will be used to ensure credible results are summarized. *(Journal of the Division for Early Childhood, in press, 10 pages).*

Cost: $1.00

87. **Ethical, practical, and scientific considerations of randomized experiments in early intervention efficacy research.**
(White, K. R., & Pezzino, J.)
Many people have argued that randomized experiments in early childhood special education are unethical and/or unpractical. This paper explains why properly implemented randomized experiments are not only ethical and practical, but also summarizes the benefits of such designs from a scientific perspective. *(Topics in Early Childhood Special Education, 1986, 6, 100-116).*

Cost: $1.50

88. **Evaluating educational and social programs: Guidelines for proposal review, on-site evaluation, evaluation contracts, and technical assistance.**
(Worthen, B. R., & White, K. R.)
The rationale and procedures for using program evaluation procedures to improve projects funded by local, state, and federal agencies is described. Particular emphasis is placed on practical application of concepts and numerous examples of rating sheets, instruments, and guidelines are included. *(Available from Kluwer-Nijhoff publishers, Boston, MA, 1987, 347 pages).*

89. **Data tape and documentation for the meta-analysis of early intervention efficacy.**
Since 1982, the Early Intervention Research Institute has collected and analyzed information from over 350 research studies which have examined the efficacy of early intervention with handicapped, at-risk, or disadvantaged children. The data tape contains quantitatively coded information about each study in five areas: (1) The type of subjects included in the research; (2) the nature of the intervention; (3) the research design; (4) the outcomes measured; and (5) the conclusions reached. Data is available in a 5-1/4" floppy disk or a 1600 BPI unlabelled tape created on a VAX computer. It contains the coded information for each of the studies for over 90 variables in these five categories. The documentation includes over 200 pages of information including the procedures followed in collecting and coding the information, the conventions used in coding, complete references for each of the coded studies, and the codebook for the data tape. The data tape and documentation is available for the cost of reproduction to interested researchers to conduct further analyses.
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PAPERS AND PRESENTATIONS

Casto, G. (1986, June). Long-term effectiveness of early intervention in Down syndrome. Paper presented at the Second Annual Research and Practice in Down Syndrome Conference, Logan, UT.

Casto, G. (1986, May). The efficacy of early intervention: Separating fact from fiction. Paper presented to the Gulf Coast Early Intervention Conference, Delta Shores, AL.

Casto, G. (1986, May). The efficacy of early intervention with Down syndrome preschoolers. Paper presented to the American Association of Mental Deficiency, Denver, CO.

Casto, G. (1986, May). *What we know about early intervention efficacy*. Keynote speech at the Annual Conference on Early Intervention, Billings, MT.

Scruggs, T. E., & Mastropieri, M. A. (1986, May). *Early intervention for social withdrawal: A quantitative synthesis of single subject research*. Paper presented at the annual meeting of the Association for Behavior Analysis, Milwaukee, WI.

Casto, G. (1986, April). *The relationship of program intensity and duration to the efficacy of early intervention*. Paper presented to the Council for Exceptional Children annual conference, New Orleans, LA.

Tingey, C. (1986, April). *Adaptions in learning for children with Down syndrome from birth to adult*. Paper presented at the Utah Down Syndrome Foundation Conference, Ogden, UT.

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Tingey, C. (1985, November). *Sisters and brothers of individuals with Down syndrome*. Paper presented to the National Down Syndrome Conference, Anaheim, CA.

White, K. (1985, November). *How research findings should affect policy decisions in early childhood special education*. Paper presented to the U.S. Congressional Staff, Washington, DC.

Casto, G. (1985, October). *Children with special needs*. Paper presented to the National Early Childhood Conference on Children with Special Needs, Denver, CO.

Casto, G. (1985, October). *Early intervention--is it better*? Paper presented at the Rocky Mountain Educational Research Association conference, University of New Mexico, Las Cruces.

Casto, G. (1985, October). *Efficacy of early intervention*. Paper presented to the National Institute of Child Health and Human Development Conference on Behavioral Intervention with High Risk Infants, Bethesda, MD.

Casto, G. (1985, October). *Implications for public policy of the Early Intervention Research Institute's meta-analysis*. Paper presented to the National Early Childhood Conference on Children with Special Needs, Denver, CO.

Casto, G. (1985, October). *Policy implications of early intervention efficacy research*. Paper presented to the Nebraska Council for Exceptional Children conference, Grand Island, NB.

Casto, G. (1985, October). *Using research to affect policy decisions on early childhood special education*. Paper presented to the Utah State Board of Education, Salt Lake City, UT.

Pezzino, J. (1985, October). *Efficacy, cost and policy implications of early intervention research with special needs children*. Paper presented to the New Mexico State Council for Exceptional Children Conference, Santa Fe, NM.

Peterson, A. (1985, September). *The MAPPS project*. Paper presented to the regional meeting of the National Diffusion Network, Portland, ME.

Peterson, A. (1985, September). Presentation on the MAPPS project. Presented to the Council for Exceptional Children, Phoenix, AZ.

White, K. R., & Mott, S. (1985, July). Pilot programs for comprehensive services to handicapped children ages birth to three years. Paper presented to the Illinois State Board of Education and Governor's Planning Council on Developmental Disabilities, Writer's Workshop for Pilot Programs for Handicapped Children up to Three Years of Age, Springfield, IL.

Barnett, W. S. (1985, June). The Perry Preschool Study: Implications for policy and practice. Paper presented at the Utah Interinstitutional Tenth Annual Early Childhood Conference, Salt Lake City, UT.

Casto, G. (1985, June). Early intervention programs for Down syndrome. Paper presented at the Conference on Research and Practice in Down Syndrome, Logan, UT.

Casto, G. (1985, June). Plasticity and the handicapped child. Paper presented at the Malleability of Children Conference Agenda, Rougemont, NC.

Frede, E. (1985, June). Using systematic observation as a teacher-training tool. Paper presented at the Utah Interinstitutional Tenth Annual Early Childhood Conference, Salt Lake City, UT.

Mitchell, H. (1985, May). Handicapped services on the Navajo reservation. Paper presented at the National Head Start Association Twelfth Annual Child and Family Development Training Conference, San Juan, Puerto Rico.

Barnett, W. S. (1985, April). The long-term effects of preschool programs: Implications for research and public policy of the Perry Preschool Program's long-term effects. Paper presented at the annual conference of the American Educational Research Association, Chicago, IL.

Casto, G. (1985, April). The efficacy of early intervention. Paper presented at the annual conference of the Council on Exceptional Children, Anaheim, CA.

Casto, G. (1985, April). The efficacy of early intervention for handicapped infants. Paper presented at the Iowa Early Intervention Conference, Cedar Rapids, IA.

Casto, G. (1985, April). Efficacy research with infant populations. Paper presented at the Oklahoma State Early Childhood Conference, Oklahoma City, OK.

Pezzino, J. (1985, April). An analysis of intervention programs of varying intensities. Paper presented at the Oklahoma State Early Childhood Conference, Oklahoma City, OK.

Pezzino, J. (1985, April). A cost-effectiveness comparison: Professionals versus paraprofessionals as intervenors for young handicapped children. Paper presented at the Council for Exceptional Children Annual Convention, Anaheim, CA.

Pezzino, J., & Barnett, W. S. (1985, April). Cost-effectiveness analysis of two programs of different intensities for handicapped preschoolers. Paper presented at the Iowa State Conference on Special Education, Cedar Rapids, IA.

Pezzino, J., & Lux, J. (1985, April). Cost-effectiveness analysis of two early intervention programs of different intensity. Paper presented at the Iowa State Conference on Innovative Practices in Special Education.

Barnett, W. S. (1985, March). Cost-effectiveness of early intervention programs for disadvantaged and handicapped children. Paper presented at the conference of the National Consortium of Early Childhood/Special Education Coordinators, Denver, CO.

Casto, G. (1985, March). The efficacy of early intervention with handicapped preschoolers. Paper presented at the conference of the National Consortium of Early Childhood/Special Education Coordinators, Denver, CO.

Mastropieri, M. A., White, K. R., & Casto, G. (1985, March). Efficacy of early intervention for the handicapped and disabled: A meta-analysis. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Pezzino, J., & Lauritzen, V. (1985, March). A description of the P.I.E. parent-training curriculum. Paper presented at the Assessment and Intervention Strategies for Developmentally Disabled and Mentally Retarded Infants and Preschoolers Conference, Salt Lake City, UT.

Pezzino, J., & Lauritzen, V. (1985, March). A training curriculum for parents of handicapped preschoolers. Paper presented at the Utah State Conference of Strategies for Developmentally Disabled and Mentally Retarded Infants and Preschoolers, Salt Lake City, UT.

Quintero, M., Mott, S., Adams, P., Killoran, J., & Striefel, S. (1985, March). Functional mainstreaming for success. Paper presented at the Assessment and Intervention Strategies for Developmentally Disabled and Mentally Retarded Infants and Preschoolers Conference, Salt Lake City, UT.

Casto, G. (1985, February). The efficacy of early intervention with medically at-risk infants. Paper presented at the Medical University of Charleston, Charleston, SC.

Mastropieri, M. A. (1985, February). Promoting generalization of social and academic behaviors from special to regular classroom settings. Paper presented at the annual conference of the Association for Children and Adults with Learning Disabilities, San Francisco, CA.

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Casto, G., Barnett, W. S., & Pezzino, J. (1984, December). Efficacy studies in early intervention. Paper presented at the Handicapped Children Early Education Program Conference, Washington, DC.

White, K. R. (1984, December). The efficacy of early intervention: Separating fact from folklore. Invited address presented in the Charles Stewart Mott Foundation Lecture Series, Harvard University, Cambridge, MA.

White, K. R. (1984, December). Guidelines for conducting early intervention efficacy research. Paper presented at the Handicapped Children Early Education Program Conference, Washington, DC.

Mastropieri, M. A., & Casto, G. (1984, November). Early intervention for behavior disorders: An integrative review. Paper presented at the Eighth Annual Conference on Severe Behavior Disorders, Tempe, AZ.

Casto, G. (1984, October). The relationship of age at start and the degree of parental involvement to intervention effectiveness. Paper presented at the Rocky Mountain Educational Research Conference, Oklahoma City, OK.

White, K. R. (1984, October). Evaluating early intervention programs: Conclusions from previous research. Invited address presented at Infants at Risk: A New England Institute, Portland, ME.

Casto, G. (1984, September). The efficacy of intervention programs for severely handicapped preschool children. Paper presented at the Midwestern Conference on Deaf-Blind, Chicago, IL.

Casto, G. (1984, April). A report on EIRI meta-analysis. Paper presented at the 62nd Annual Convention of the Council on Exceptional Children, Washington, DC.

Pezzino, J. (1984, April). Cost-effectiveness of early intervention programs. Paper presented at the 62nd Annual Convention of the Council on Exceptional Children, Washington, DC.

Pezzino, J. (1984, April). A critique of cost-effectiveness research. Paper presented at the 62nd Annual Convention of the Council on Exceptional Children, Washington, DC.

Pezzino, J., Goudie, K., & Casto, G. (1984, April). A comparison of two service delivery modes in delivering speech, occupational and physical therapy to handicapped children. Paper presented at the 62nd Annual Convention of the Council on Exceptional Children, Washington, DC.

White, K. R. (1984, April). Applications of meta-analysis to special education: Efficacy of early intervention with handicapped and at-risk children. Paper presented at the 62nd Annual Convention of the Council on Exceptional Children, Washington, DC.

White, K. R. (1984, April). Efficacy of early intervention. Presentation given to the annual conference of the Utah Chapter of the American Association on Mental Deficiency, Provo, UT.

White, K. R. (1984, February). Contributions of research to the development and implementation of early intervention programs. Paper presented at the meeting of the National Consortium of State Agency Preschool Coordinators, Denver, CO.

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White, K. R. (1983, December). Conducting efficacy research with early intervention programs. Paper presented at a conference of the National Center for Clinical Infant Programs, Washington, DC.

White, K. R., & Casto, G. (1983, December). A meta-analysis of the efficacy of early intervention with handicapped and at-risk children. Paper presented at the annual meeting of the Division of Early Childhood Handicapped Children Early Education Program, Washington, DC.

White, K. R., Casto, G., & Mastropieri, M. A. (1983, December). Meta-analysis: Early intervention research literature and HCEEP validated projects. Paper presented at the Directors' Conference of the Division of Early Childhood, Washington, DC.

White, K. R., & Watkins, S. (1983, December). Longitudinal effects of various types of early intervention with hearing impaired children. Paper presented at the annual meeting of the Division of Early Childhood Handicapped Children Early Education Program, Washington, DC.

Bush, D. W., & White, K. R. (1983, April). The efficacy of early intervention: What can be learned from previous reviews of the literature? Paper presented at the annual meeting of the Rocky Mountain Psychological Association, Snowbird, UT.

Casto, G., & Casto, Y. (1983, April). Intervening with high risk infants. Paper presented at the Fourth Annual Montana Symposium on Early Education of the Exceptional Child, Billings, MT.

Casto, G., & Clarkson, D. (1983, April). Selecting outcome measures in early intervention. Paper presented at the Fourth Annual Montana Symposium on Early Education of the Exceptional Child, Billings, MT.

Casto, G., Shearer, D. E., Cavaleri, T. (1983, April). Critical issues in early intervention: A view from the field. Paper presented at the Rocky Mountain Psychological Association Conference, Snowbird, UT.

Pezzino, J., & Taylor, C. (1983, April). A critical review: Cost-effectiveness analysis in human service research. Paper presented at the Rocky Mountain Psychological Association Conference, Snowbird, UT.

Casto, G., & Shearer, D. (1983, March). Previous reviewers' conclusions about the effectiveness of early intervention. Paper presented at the Montana Conference for Severely Handicapped, Billings, MT.

Shearer, D. (1983, February). The Early Intervention Research Institute. Presentation at the Research in Action II Conference, Lubbock, TX.

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Casto, G. (1982, December). Criteria for selecting replication sites: Research report. Paper presented at the Handicapped Children's Early Education Program/Division of the Early Childhood Education Conference, Washington, DC.

Shearer, D. (1982, December). Problem replication sites: How to avoid them. Panel presentation at the Handicapped Children's Early Education Program/Division of the Early Childhood Education Conference, Washington, DC.

Shearer, D. (1982, December). Providing comprehensive services to young handicapped children at the local level. Paper presented at the Handicapped Children's Early Education Program/Division of the Early Childhood Education Conference, Washington, DC.

Casto, G. (1982, November). Systems for increasing engaged learning time in preschoolers. Workshop presentation, Browning, MT.

Cadez, M., Peterson, A., & Casto, G. (1982, August). Programming for the young preschool handicapped child. Paper presented at the MAPPS Workshop, Powell, WY.

Shearer, D. (1982, August). Early intervention strategies--the Portage Project: Parent training. Paper presented at chair of panel at the Sixth International Congress of the International Association for the Scientific Study of Mental Deficiency, Toronto, Canada.

Casto, G., & Myette, B. (1982, June). A respite care model for rural areas. Paper presented to the 106th annual meeting of the American Association on Mental Deficiency, Boston, MA.

Shearer, D. (1982, June). Professional support systems for early childhood special educators. Presentation to Tennessee annual conference on Developmentally Delayed Children, University of the South, Sewanee, TN.

Casto, G. (1982, May). Exemplary preschool practices in rural areas. Workshop Chairman and paper presented to Handicapped Children's Third Annual National Rural Workshop, Salt Lake City, UT.

Casto, G., & Payant, J. (1982, May). Use of behavioral principles in preschool programming. Symposium presentation to the eighth annual convention of the Association for Behavior Analysis, Milwaukee, WI.

Casto, G., (1982, April). Design and development of a statewide preschool evaluation system. Paper presented at the 60th anniversary annual International Convention of the Council for Exceptional Children, Houston, TX.

WORKSHOPS

Barnett, W. S., & Casto, G. (2 hours). Meta-analysis and early childhood programs to 60 special education and early childhood personnel, Lincoln, NB.

Casto, G. (30 hours). MAPPS model for delivering services to preschoolers to 30 parents and special educators, Billings, MT.

Casto, G. (8 hours). State of Washington early education awareness, to 75 teachers, aides, and administrators, Seattle, WA.

Casto, G. (6 hours). Impact indicators of HCEEP project effectiveness, to 29 HCEEP coordinators and staff, Washington, DC.

Casto, G., Miller, N., & Baer, R. (2 hours). State-wide training for preschool providers to 15 participants, Reno, NV.

Casto, G., Peterson, A., & Lauritzen, V. Assessment, programming for handicapped child, developing IEPs, working with parents, Public Law 94-142 to 25 Headstart program administrators, teachers, and aides from Idaho, Nevada, Utah, and Arizona.

Casto, C., Peterson, A., Tolfa, D., Beasley, T. (5 workshops). Handicapping conditions, Public Law 94-142, Headstart performance to ONEO Headstart Workshop, 150 teachers, aides, and paraprofessionals. Chinle, Tuba City, Ft. Defiance, AZ; Crowpoint, Shiprock, NM.

Casto, G., Peterson, A, & Hughes, D. (10 hours). Improving services to rural developmentally delayed preschoolers to 16 teachers, aides, and therapists, Reno, NV.

Casto, G., Peterson, A., & Casto, Y. (16 hours). Use of the Battelle Developmental Inventory to 8 teachers and psychologists, Las Vegas, NV.

Casto, G., Peterson, A. Chambers, N., Reese, N., Campbell, G., Shearer, D., Cochran, D. (16 hours). Head Start Health and Handicapped Workshop, Improving Head Start capability to serve handicapped children to 24 Utah State Head Start directors, Logan, UT.

Casto, G., Pezzino, J., & Myette, B. (4 hours). The efficacy and cost effectiveness of early intervention for handicapped and language disordered children to 30 participants at the Annual Conference on Early Intervention, Billings, MT.

Frede, E. (3 hours). A cognitive-developmental approach to teaching in special needs and integrated classrooms to 40 teachers and administrators at the Assessment and Intervention Strategies for Developmentally Disabled and Mentally Retarded Infants and Preschoolers Conference, Salt Lake City, UT.

Mitchell, H., Shearer, D., & Cassidy, S. (40 hours). Multi-Agency Project for Preschoolers to 40 Headstart teachers, Blanding and Price, UT.

Pezzino, J. (8 hours). Training interviewers and teaching cost procedures to 10 researchers, Logan, UT.

Shearer, D., & Brower, D. (8 hours). Parental involvement discussion to 45 special education personnel, Cheyenne, WY.

Taylor, C. (1 hour). Research on the cost-effectiveness of intervention programs, to 15 administrators, Washington, DC.

Tolfa, D., Casto, G., Hencinski, C., Peterson, A., Myette, B., Carlson, L., & Serna, R. (18 hours). MAPPS Project Workshop, ECC to 14 MAPPS site personnel, Logan, UT.

White, K., & Mott, S. (4 hours). Assessing outcomes in early intervention programs to 30 participants, Washington, DC.

Graduate Students Trained by EIRI

During 1986-87

Ellen Frede received her B.A. degree from the University of Michigan in early childhood and her M.A. degree from Pacific Oakes College in human development. She is currently a doctoral student in the Family and Human Development Department at Utah State University and was awarded a Presidential Fellowship during the 1986-87 academic year. She has functioned as a research evaluation specialist at EIRI, working on treatment verification and parent child interaction measures.

Teri Wingate-Corey is a doctoral student in the Psychology Department's Professional Scientific curriculum at USU. She received her B.S. from Weber State College with a double major in psychology and political science. Her M.A. is from the University of Missouri, St. Louis, in industrial psychology. She has been the program coordinator of the Salt Lake City Retroactive IVH Project and has been involved in grant writing, data analysis, and dissemination of information.

Todd Braeger is currently a candidate for the M.S. degree in family and human development and the Ph.D. degree in developmental psychology at USU. He completed double majors in chemistry and psychology, receiving concurrent B.S. degrees from South Dakota State University. He has been involved in data coding and analysis, and review of literature while a graduate student with EIRI. He has co-authored a paper with Stacey Mott, Ph.D, "Impact on Family Scale," now in press.

Robert L. Bailey is a professional scientific doctoral student in the Psychology Department at USU. He received a B.S. in psychology and a B.A. in English at Brigham Young University, and an M.S. in counseling from Henderson State University. With EIRI, his responsibilities have included data checking and library research. He has also developed and conducted a 10-week program for siblings of handicapping preschoolers.

Carl Summers received his B.S. in psychology and his M.S. in economics from Brigham Young University. He is currently a candidate for the M.B.A. degree at the

University of Nebraska and is a doctoral student of research and evaluation in the Psychology Department at USU. His responsibilities at EIRI have included assisting with site coordination, grant writing, and data analysis.

John J. Shamaly, Jr. completed his B.S. degree in psychology at Northeastern University. He is currently a doctoral student in the Analysis of Behavior Program of the USU Psychology Department. While a graduate student with EIRI, he has been a research assistant for Project TEAM (Team Education for Adolescent Mothers). In this capacity, he has been responsible for updating and maintaining the project data base and reporting findings. In addition, he has been involved in parent training, training of classroom observers, and data analysis.

Richard Elghammer is a doctoral candidate in the USU Psychology Department's Professional Scientific Program. He received his undergraduate degree in psychology from Baylor University and his M.A. in the same field from Eastern Illinois University. His responsibilities with EIRI have included administration of developmental tests to IVH subjects, out-of-state and out-of-town scoring of IVH, literature research and summary, grant writing, and data analysis.

Mary Ann Hanson has coordinated testing at the Salt Lake City DDI site, recorded data, and checked scoring while working with EIRI. She has also served as photographer at public relations functions for EIRI. Ms. Hanson earned a B.A. degree in speech pathology from Moorehead State College and an M.A. in speech pathology from the University of Washington. Currently, she is enrolled as a Master of Fine Arts student in art and photography at USU.

Arunday Saha received his B.A. and M.A. in economics from the University of Calcutta. He is currently a Ph.D. degree candidate in economics from USU and serves the EIRI project as an economic research consultant.

William Corey is a doctoral candidate in the USU Psychology Department's Professional Scientific Program. He has a B.A. from the University of Missouri, St. Louis, in psychology and an M.S. in counseling from USU. His responsibilities at

EIRI have included statistical consulting, data analysis, and grant writing.

Mark Innocenti received his B.S. degree from Northeastern University in Psychology. He earned his M.S. degree from USU in the Psychology Department's Analysis of Behavior Program and is currently a Ph.D candidate in that department. While a graduate student with EIRI, he has acted as a site coordinator, analyzed data, and written a book chapter on teaching techniques in natural environments.

David Calhoun earned a B.A. degree in psychology from San Jose State University at San Jose and is currently enrolled in the master's degree Analysis of Behavior Program in the Psychology Department at USU. He has been involved in data coding, test scoring, and library research for the EIRI project.

Steven Curtis graduated from the University of California at Los Angeles with a B.A. degree in psychology. He is now a master's degree student in the USU Psychology Department's Analysis of Behavior Program. His duties with the EIRI project have included test scoring, data coding, and library research.

Helal Mobasher has provided EIRI with assistance in data and statistical analysis. He has also provided computer consulting and assistance, and computer program development. Mr. Mobasher received a B.S. degree from Tehran College of Insurance and a B.S. and M.S. in Sociology from USU. He is currently a Ph.D candidate in sociology.

Kivi Sun Huh is a doctoral student in developmental psychology at USU. She has been involved in data coding, test scoring, data analysis, and library research while at EIRI.

Judith Waidler earned a B.S. degree in psychology from Portland State University and an M.S. in therapeutic recreation from San Jose State University. She is currently a doctoral student in the Professional Scientific Program at USU. Her responsibilities at EIRI have included assisting with site coordination, data and statistical analysis, testing and test scoring, and dissemination of information.

Jyme Waidler has assisted the EIRI project in test scoring, data analysis, and video editing. He received a B.A. in international relations from California State University at Hayward and is enrolled in a USU Master of Arts degree program in communication with a specialization in documentary journalism.

Sung-Il Kim is a graduate student in the Research and Evaluation Program of the USU Psychology Department. He has assisted the EIRI project with test scoring and data coding.

Eun-hee Shin is a graduate student in the USU Psychology Department's Research and Evaluation Program. Her responsibilities with EIRI have included test scoring and data coding.

APPENDIX II

Materials Related to Instrumentation Procedures

Total Participants = 24

Shows percentages of Raters' Responses

BDI TRAINING EVALUATION

I. EVALUATION OF PRESENTER

Overall Rating of Presenter		Knowledge of Subject Matter		Ability to Explain		Attitude Toward Participants	
38%	Outstanding	71%	Very well informed	29%	Outstanding	92%	Very helpful and understanding
58%	Better than average	29%	Adequately informed	63%	Clear and to the point	8%	Interested
4%	Average		Somewhat informed	8%	Usually adequate		Neutral
	Below average		Not well informed		Somewhat inadequate		Distant, cold
	Poor		Poorly informed		Disinterested		Negative

II. EVALUATION OF CONTENT

SA = Strongly agree A = Agree U = Undecided D= Disagree SD = Strongly disagree

1.	Training was well organized.	[✓ SA] 54%	A 42%	U 4%	D	SD
2.	BDI pretraining materials adequately prepared the participants for group training.	SA 42%	[✓ A] 46%	U 12%	D	SD
3.	The presentation was well-structured and organized.	[✓ SA] 71%	A 25%	U 4%	D	SD
4.	Sufficient time was allotted to ask questions.	[✓ SA] 63%	A 33%	U 4%	D	SD
5.	The presentation was clear and understandable.	[✓ SA] 58%	A 42%	U	D	SD
6.	The training was an appropriate length of time.	SA 42%	[✓ A] 46%	U 8%	D 4%	SD
7.	The video tape helped in understanding the key elements of the test.	SA 38%	[✓ A] 50%	U 8%	D 4%	SD
8.	The mastery tests were an adequate tool for measuring the participants' knowledge of the BDI administration.	SA 23%	[✓ A] 64%	U 9%	D 4%	SD

9.	The room in which training occurred was conducive for instruction.	[✓ SA] 54%	A 50%	U 4%	D 4%	SD
10.	The materials dealing with scoring were clear and thorough.	[✓ SA] 54%	A 42%	U 4%	D	SD
11.	The instruction involving adaptation for the handicapped was sufficient.	SA 25%	[✓ A] 54%	U 4%	D 17%	SD
12.	The degree of practice in the group training was adequate.	SA 25%	[✓ A] 50%	U 17%	D 8%	SD
13.	The number of BDI's to be administered in order to pass was reasonable.	SA 30%	[✓ A] 35%	[✓ U] 35%	D	SD

What would you have changed about the workshop?

Practicing with "live" child, more videotapes, more discussions of adaptations for handicapped, make sure there is a sufficient number of BDI kits.

What did you find most helpful about this workshop?

Videotapes, practice scoring, handouts, practice of item administration, knowledge of presenter and ability to answer questions.

Other comments:

Appreciated break time and refreshments, relaxed and informative workshop, nice people, well organized.

TRAINING AND MONITORING PROCEDURES FOR BATTELLE DIAGNOSTICIANS

Training Phase	Activities	Performance Criteria
I. Individualized Pretraining	1. Study of BDI Manuals and review of introductory videotape	90% accuracy on practice scoring and self-mastery test
	2. Complete 2 practice scoring booklets	
	3. View videotape depicting preparations and interview procedures	
	4. Complete self-mastery test	
II. Group Training	1. Overview, standardization, concurrent validity	90% accuracy on group mastery test
	2. Scoring	
	3. Domain-specific information and practice administration of selected items	Correct administration of practice items
	4. View and respond to videotape depicting correct/ incorrect item administration	
	5. Complete group mastery test	
	6. Complete participant satisfaction survey	
III. Certification of Performance	1. Complete three practice administrations and score protocols	90% accuracy on protocols
	2. Administration of selected test items under observation	80% accuracy on observed administration
IV. Monitoring of Performance	1. Videotape of one actual test administration	.85 interrater reliability
	2. Observation of 10% of actual test administrations	.85 interrater reliability
	3. Rescoring of protocols by EIRI staff	80% accuracy

Kathryn Haring
1/20/87

Videotaped Assessment of Severely Handicapped

Introduction

The following procedures should be followed for conducting a videotaped assessment of severely handicapped children. The purpose of this videotape is to demonstrate progress towards specific goals. The videotape should be taken a minimum of twice, at the program onset and after at least six months of intervention. The major intervenor is instructed to identify two or three goals that are of primary importance for that child. These goals are to be written on the attached data sheet. The videotape will consist of the standard program utilized to develop and reinforce each goal. The child's responses to the program will be recorded initially as a pre-test and recorded again after a minimum of six (preferably nine to twelve) months of consistent intervention. The entire taping session should last no longer than 25 minutes. Sites with a subject population of at least 25% severely handicapped subjects are encouraged to use this videotaping procedure.

The primary intervenor should select goals that are in the most critical areas of concern for the child, will offer a behavior sample that represents the child's functional level, and can be taped in a setting outside of the classroom or home. For example, Jason is a physically handicapped, mentally retarded three year old. His three major goal areas are communication, self-help, and cognitive. He has several problems in each area and the teacher selects two that can be easily taped. The first program involves use of a communication board. Although the board is used throughout Jason's day, there is a specific daily program to teach yes/no awareness that is selected for taping. The area of self-help is worked on in more naturally occurring settings and the decision is made not to tape a program in that area. One of Jason's cognitive programs is silverware sorting, this is also selected for taping. All needed materials are assembled and the room is set for taping before Jason and his teacher enter. The programs are conducted exactly as they are in the instructional setting.

Settings and Materials

The videotaping should be set up in a room with limited distractions. The primary intervenor should be instructed to set up all necessary equipment and materials. A representative sample of a program designed to develop each specific skill should be videotaped. For example, if the goal is to turn to sound, several trials on each side with more than one sound stimulus should be taped. If the goal is to reduce tongue thrusting to facilitate eating, then a brief eating session should be taped.

It is important to consider the inconsistent nature of severely handicapped children's performance. If a health problem, for example, seizuring, a cold, or changes in medication occurs, do not tape that day.

Data Sheet

A data sheet should be filled out on each child videotaped. It is intended to describe what is being taped. The intervenor should be the person primarily responsible for conducting the child's program. The goals and objectives should come from the child's IEP. It is important that the number on the tape counter be recorded at the beginning and end of the tape. Space for this is provided at the bottom of the page.

Definition of Severely Handicapped

"The severely handicapped individual is one whose ability to provide for his or her own life - sustaining and safety needs is so limited, relative to the proficiency expected on the basis of chronological age, that it could pose a serious threat to his or her own survival" (Baker, 1979). The term includes children who are severely emotionally disturbed (autistic or schizophrenic), severely and profoundly mentally retarded, and those with two or more serious handicapping conditions, for example, a mentally retarded blind or cerebral-palsied deaf child.

DATA SHEET: SEVERELY HANDICAPPED VIDEOTAPE

Child name ______________________ ID # ____________

Intervenor ______________________ Site ____________

Date ____________________ Time ____________

Long Term Goal #1: ____

____

Current objective: ____

____

Criteria: ____

____

Materials used: ____

____

Long Term Goal #2: ____

____

Current objective: ____

____

Criteria: ____

____

Materials used: ____

____

Long Term Goal #3: ____

____

Current objective: ____

____

Criteria: ____

____

Materials used: ____

____

Tape Counter # Start ______
End ______

S. Mott
11-7-86

VIDEOTAPED ASSESSMENT OF MOTOR FUNCTIONING

Introduction

The following script should be used for conducting a videotaped assessment of motor behavior in children up to 18 months of age. The purpose of this videotape is to elicit motor behaviors which can then be rated qualitatively by a motor therapist. Inform the mother that she will be given specific instructions for playing with her baby in order to observe the child's skills in reaching, sitting, crawling, and standing. The entire taping session should last no longer than 15-20 minutes. The child should be wearing only a diaper in order to observe the child's movement more easily.

Setting and Materials

The videotape equipment should be set up in a room with very few distractions. A pull-up bench and several small toys (no larger than three inches in diameter so that the child can easily grasp them in one hand) are the only equipment necessary. Both the mother and the child must be present for the videotape.

Instructions

Based on the child's level of motor development, the child's mother should be encouraged to attempt to elicit as many of the following behaviors, in sequence, as possible.

Reaching and grasping from supine position. Have the mother place the child on his or her back. Instruct the mother to hold the toy over the center of the child's chest and to attract the child's attention to the toy in order to stimulate grasping and reaching behavior.

S. Mott
11-7-86

Rolling over and reaching and grasping from prone position. Ask the mother to move the toy to the child's side to encourage rolling over on the stomach. When the child has rolled over (or, if the child will not roll over, the mother should place the child on his or her stomach), place the toy slightly out of the child's reach, and encourage the child to reach for it. Allow the child to play with the toy briefly.

Creeping and crawling. While the child is on his/her stomach, have the mother take the toy and place it far enough out of the child's reach so that the child has to make crawling movements to reach it. Have the mother encourage the child to crawl to the toy.

Sitting and reaching. Have the mother place the child on his/her back and to encourage the child to sit up. If the child will not move to a sitting position on his/her own, place the child in a sitting position (with as little support as possible) and obtain the child's attention by shaking the toy. Hold the toy slightly out of the child's reach and encourage the child to reach for the toy. Allow the child to play briefly with the toy.

Pulling to stand. When child is in a sitting position, place the toy on the pull-up bench and encourage the child to pull to standing. When child has pulled to stand, allow him/her to play with toy briefly. Have mother place the toy slightly out of child's reach and encourage child to reach for the toy while in a standing position.

Walking. Have the mother encourage the child to walk, using as little support as necessary. The child should also be encouraged to walk while holding the toy.

S. Mott
11-7-86

Squatting to pick up toy. After placing the toy on the floor, mother should encourage the child to get the toy and to return to a standing position.

VIDEOTAPED ASSESSMENT OF PARENT-CHILD INTERACTION

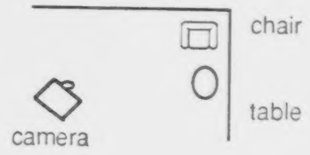
LS: 2/23/87

Introduction

The following script should be used for conducting a videotaped assessment of parent-child interaction. The purpose of this videotape is to elicit interaction between the primary caregiver and the child in free-play and structured activities which can then be analyzed to assess interaction patterns. Only the caregiver, the handicapped child, and the individual doing the videotaping should be present during the videotaping sequence. The entire taping session should last 21 minutes and it is important that the sequence of activities and time constraints be followed as outlined below.

Setting

The setting and the individual doing the videotaping should be equally unfamiliar to all caregivers/children. Set up the videotape equipment in a small carpeted room (approximately 12' by 12'). The caregiver may choose to interact with the child on the floor or sitting in a chair. A comfortable adult-sized chair (or sofa) and an end table should be arranged in a corner area as shown below:



The camera should be positioned on a tripod approximately 8-10' from the subjects, should be aimed at the eye level of the caregiver, and should not be directed toward a window. Videotape the caregiver and the child so that the frame includes both participants' faces and hands.

Materials

1. Toys:
   - a. red carrying box (place other items inside)
   - b. dolls
   - c. ball
   - d. cloth
   - e. fuzzy green bear
   - f. play telephone
   - g. rattle

   } Items from Battelle kit.

   - h. building blocks
   - i. musical toy (xylophone)
   - j. pull toy

   } Items you need to obtain.

   Also provide two books appropriate for the child, but do not place these in the red carrying box.
2. Audiotape and recorder for cueing the caregiver.
3. Printed activity cue cards.

Instructions

1. Place the box of toys and the books near the area where the caregiver will sit.
2. Place the activity cue cards where the caregiver can easily see them as the videotaping sequence progresses and where the individual videotaping can turn them as necessary.
3. Get to know the caregiver and the child for a few minutes to create a relaxed setting. Discuss the instructions outlined below (in bold print) and the manipulation of materials as they should occur with the caregiver as follows:

> **"We're interested in observing (name of child) in a play session. When specific cues are given during the 21-minute videotaping sequence, you will be asked to do the following** (show caregiver the printed activity cue cards as you explain each one):

1st beep--Simply relax and play together as you would at home (15 minutes); you may use the toys in the box if you want to, or you may spend some time playing your favorite games without using the toys. Save the books for the reading activity.

2nd beep--Encourage your child to put away the toys--you may help, if necessary. (1 minute)

3rd beep--Read a book to your child. (2 minutes)

4th beep--Leave the room and count slowly to 45 before returning. (45 seconds)

The videotaping will continue for 2 minutes after you re-enter the room.

> **The recorded beep and the cue card will let you know when to begin each activity. After the videotaping has begun, please try to ignore me and interact only with (name of child). Do you have any questions?"**

4. After answering any questions, position the cards so that the top card which reads "PLAY TOGETHER" is showing.
5. Start the tape recorder--you should hear an initial beep on the tape. (Adjust the loudness of the tone so that it will not be distracting to the child. Rewind the tape and start it again.)
6. Begin videotaping, turning the cue cards after each beep. If the caregiver does not respond to the cue cards, give a verbal reminder.
7. Continue videotaping, filming at least 2 minutes of interaction after the caregiver re-enters the room.

PROGRAM SUMMARY GUIDE

This instrument is designed to be used in conjunction with the site review procedures detailed in the preceding sections of the Guide for Review of Early Intervention Research Programs.

It is intended to be used by a review team composed of persons familiar with the day-to-day operations of the program and an outside member who will coordinate the review process. Its primary purpose is to help organize and summarize the team's findings.

Ideas for the format and specific items from the TADS Manual for Comprehensive Program Review (Black, Cox, Danaher, Prestridge, Trohanis, & Assael, 1984), the Accreditation Criteria and Procedures of the National Academy of Early Childhood Programs, and various preschool internal evaluation systems developed by the Early Intervention Research Institute at Utah State University were used to develop this instrument.

Directions

Score each criterion according to the "Rating Key" below in the column entitled "Overall Rating". Several of the criteria should be rated after the revierwers have completed a worksheet which relates to those criteria in questions. Those criteria which have a related worksheet are indicated and can be found at the end of the Program Summary Guide. Most of the criteria, however, can be rated directly without first completing a worksheet.

In the "Comments" section, indicate any problems or circumstances which may reflect on the validity of the data. Notes regarding the appropriateness of a criterion and the source of the inforamtion upon which the rating is based should also be included in this section.

Rating Key:
0 = Not Met (all or nearly all elements of a criterion are absent or seriously flawed)
1 = Partially Met (a substantial portion of the criterion has been met, however, significant elements are absent and/or flawed)
2 = Fully Met (the criterion is completely met or only minor aspects of it are absent or flawed
NA = Not Applicable.

I. SERVICES FOR CHILDREN COMPONENT

A. General

This component identifies tasks related to providing services for the project's children. It includes locating, screening, and admitting children into the project. It also deals with curriculum development and carrying out IEPs.

Criteria	Overall Rating	Comments
1. **The project has an explicit statement of its philosophical/theoretical approach and an explicit statement of goals and objectives regarding services to children.**	0=not met 1=partially met 2=fully met n/a=not applicable	
2. **Criteria for service eligibility have been developed and children served meet criteria.**	0=not met 1=partially met 2=fully met n/a=not applicable	
3. **Assessment procedures which are appropriate and nondiscriminatory have been carried out for each child admitted to the program. (See Assessment Worksheet #3 prior to scoring this item)**	0=not met 1=partially met 2=fully met n/a=not applicable	

Criteria	Overall Rating	Comments
4. For every child admitted to the program, an appropriate IEP has been developed. (See IEP worksheet #2 prior to scoring this item.)	0=not met 1=partially met 2=fully met n/a=not applicable	
5. Lesson plans are consistent with IEP goals and objectives for each child.	0=not met 1=partially met 2=fully met n/a=not applicable	
6. Data collection procedures for instructional decision making has been implemented. For example, are criteria stated which specify the performance level the child needs to demonstrate prior to advancing to the subsequent teaching goal.	0=not met 1=partially met 2=fully met n/a=not applicable	
7. Appropriate instruments for assessing child progress are being used according to established timeline.	0=not met 1=partially met 2=fully met n/a=not applicable	

Criteria	Overall Rating	Comments
8. **Procedures for assisting a child's transition into another program are appropriate.**	0=not met 1=partially 2=fully met n/a=not applicable	

General Comments Regarding the Services:

(Append additional comments if necessary.)

B. Interactions Among Staff and Children

Criteria	Overall Rating	Comments
1. Staff interact positively and encourage appropriate use of language.	0=not met 1=partially met 2=fully met n/a=not applicable	
2. Staff treat children of all races, religions, and cultures equally with respect and consideration and provide children of both sexes with equal opportunities to take part in all activities.	0=not met 1=partially met 2=fully met n/a=not applicable	
3. Staff encourage developmentally appropriate independence in children. activities.	0=not met 1=partially met 2=fully met n/a=not applicable	
4. Staff use positive techniques of guidance including redirection, anticipation of and elimination of potential problems, positive reinforcement, and encouragement.	0=not met 1=partially met 2=fully met n/a=not applicable	

Criteria	Overall Rating	Comments
5. **Staff do not use inappropriate disciplinary methods or punishment.**	0=not met 1=partially 2=fully met n/a=not applicable	
6. **Staff encourage developmentally appropriate prosocial behaviors in children such as cooperating, helping, taking turns, talking to solve problems.**	0=not met 1=partially met 2=fully met n/a=not applicable	

General Comments Regarding Staff/Child Interaction:

(Append additional comments if necessary.)

C. Curriculum

Criteria	Overall Rating	Comments
1. Curricula which are consistent with the project's philosophy and goals have been developed or adopted.	0=not met 1=partially met 2=fully met n/a=not applicable	
2. Staff plan realistic curriculum goals for children based on assessment of individual needs, interests and parent's input.	0=not met 1=partially met 2=fully met n/a=not applicable	
3. The skill sequences in the curriculum extend beyond the children's current level of functioning.	0=not met 1=partially met 2=fully met n/a=not applicable	

Criteria	Overall Rating	Comments
4. **Materials and equipment which are necessary to carry out the curriculum are available.**	0=not met 1=partially met 2=fully met n/a=not applicable	
5. **Functional skill training routines are included in the curriculum to the degree appropriate.**	0=not met 1=partially met 2=fully met n/a=not applicable	

General Comments Regarding the Curriculum:

(Append additional comments if necessary.)

D. Administration and Management Component

This section deals with the overall organization, administration, and management of the project.

Criteria	Overall Rating	Comments
1. Appropriate program review and planning activities (including personnel evaluations) are used regularly.	0=not met 1=partially met 2=fully met n/a=not applicable	
2. The project has a written statement of procedures for informed consent, due process, and assurance of confidentiality.	0=not met 1=partially met 2=fully met n/a=not applicable	
3. Qualified staff are delivering services directly or are present in sufficient number to ensure adequate supervision of others. supervision of others.	0=not met 1=partially met 2=fully met n/a=not applicable	

General Comments Regarding Administration and Management:

(Append additional comments if necessary.)

E. Physical Arrangements (only apply these criteria to center-based programs)

Criteria	Overall Rating	Comments
1. The indoor and outdoor environments are safe, clean, and appropriate.	0=not met 1=partially met 2=fully met n/a=not applicable	
2. Space is arranged to accommodate children individually, in small groups, and in a large group.	0=not met 1=partially met 2=fully met n/a=not applicable	
3. A sufficient variety of age appropriate toys and equipment are available for children indoors and outdoors.	0=not met 1=partially met 2=fully met n/a=not applicable	
4. The environment includes soft elements such as rugs, cushions, or bean bags.	0=not met 1=partially met 2=fully met n/a=not applicable	

Overall Criteria	Rating	Comments
5. The outdoor play area is protected from access to streets and other dangers.	0=not met 1=partially met 2=fully met n/a=not applicable	

General Comments Regarding Physical Arrangements:

(Append additional comments if necessary.)

EIRI SITE REVIEW

Worksheet #1 Subject Data

List below ID# and other indicated information on each subject who is participating in the EIRI Research Project.

Program Name ______________________ Site Name ______________________

Subject ID#	Subject DOB	Group Affiliation (E or C)	Primary Intervenor Name	Primary Handicapping Condition	"X" Those Who Were Randomly Selected
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					

JUDGING APPROPRIATENESS OF INDIVIDUALIZED EDUCATION PLANS

Worksheet #2

Individualized Education Plans are required by P.L. 94-142 for all handicapped children. IEPs are helpful for both children and teachers. They let the child, his family, and teachers know exactly what is expected of him or her and assist the child in gaining skills and independence. They benefit teachers further by outlining the direction and purpose of the treatment, they state treatment intentions specifically, they state who is responsible for what and when, and they provide a record of achievement.

Therapeutical effectiveness can be more readily assessed when using Individualized Education Plans which specify outcomes in behavioral or operational terms. Treatment effectiveness can be maximized through the continuous monitoring of treatment progress which is required by the Individualized Education Plan. In addition, new approaches can be substituted for ineffective procedures based on results obtained from this monitoring.

The IEP recognizes and provides for individual differences. By specifying instructional goals and objectives based on the child's current level of performance and by regularly monitoring performance according to specific evaluation criteria, the probability of successful intervention with handicapped children is greatly increased.

The use of the IEP should also increase accountability for teachers. If individual responsibilities for intervention are clearly defined, they can be carried out more effectively.

Directions for Completing IEP Worksheet #2

The following worksheet accompanies the EIRI Program Summary Guide and is specifically intended to be used prior to completing criterion 3 of the Services for Children Component. The worksheet is designed so that the evaluator can assess the appropriateness of children's IEP by checking for its completeness across several items. The worksheet is completed by:

(1) listing the randomly sampled children's initials across the top left-handed columns,

(2) rating each of the criteria on degree of implementation by placing either a "2," "1," or "0" in the appropriate box.

The results of this worksheet is then used as a basis for completing Item #3 and other related items in the Services for Children Component of the EIRI Program Summary Guide.

JUDGING THE APPROPRIATENESS OF INDIVIDUALIZED EDUCATIONAL PLANS (IEP)

Worksheet #2

Rate each criterion according to the following:

Rating Scale
2 = Fully Met
1 = Partially Met
0 = Not Met

Initials of Selected Children

								A. Each IEP must contain . . . 1. Statement of the child's current level of performance. Credit given for statements regarding the student's current performance.
								2. Annual goals and short range objectives. Credit given if at least one appropriate goal and one appropriate objective were in the IEP.
								3. A description of the special services the student is to receive (educational and related). Credit given for statement or table which indicates the class or service the student will attend.
								4. The extent to which the student will participate in the regular program. Credit given for any description, ratio, or number which specifies the degree to which the student participates in the regular program.
								5. Date for initiation of services. Credit given for specified date which indicated when a class or program was to begin.
								6. Expected duration of services. Credit given for dates, timelines, or criteria which indicates when the service was to terminate.

								7. Evaluation criteria. IEP should contain specific behavioral statements about "how well" or "to what extent" an objective/goal must be attained. provided such informat given if the IEP provided such information in at least 76% of the 76% of the goals/objectives.
								8. Evaluation procedures. The IEP should contain a description of appropriate tests or testing procedures used to evaluate the student's performance. Credit given for any statement which identifies either piece of information.
								9. Timelines for monitoring. IEPs should be reviewed at least annually.

JUDGING THE APPROPRIATENESS OF ASSESSMENT PROCEDURES

Worksheet #3

The rationale for an appropriate assessment at most early intervention centers is based on a multidisciplinary evaluation stemming primarily from P.L. 94-142, P.L. 99-457. These are the Education of the Handicap Acts including amendments and the Handicapped Children's Protection Act. The most pertinent section of the law relating to child process of instrumentation are relevant. They are quoted below.

> . . . All children residing in the State who are handicapped, regardless of the severity of their handicap, and who are in need of special education and related services are identified, located, and evaluated, and that a practical method is developed and implemented to determine which children are currently receiving needed special education and related services and which children are not currently receiving needed special education and related services.
>
> . . . Procedures to assure that testing and evaluation materials and procedures are utilized for the purpose of evaluation and placement of handicapped children will be selected and administered so as not to be racially or culturally discriminatory. Such materials or procedures shall be provided and administered in the child's native language or mode of communication, unless it clearly is not feasible to do so, and no single procedure shall be the sole criterion for determining an appropriate educational program for a child. (P.L. 94-142, Section 612)

There are two important components of the multidisciplinary assessment process which are referred to above. The first is a requirement which specifies that non-biased assessment procedures should be utilized. The second specifies that no single procedure should be utilized to place a child in a special education program.

Generally, non-biased assessment procedures include provisions for testing in the child's native language when necessary, avoiding tests which contain obvious bias, and securing measures of a child's functioning level within his or her own culture.

The second issue relates to avoiding the use of one test or assessment procedure and looking at a child's performance in a variety of ways. The following guidelines should be considered in the evaluation.

1. Test battery should be individualized considering the reasons for the referral and the information desired. The limitation of tests should be respected.
2. The data should have been cross-validated using different methods for collecting the information. Parental reports, criterion-referenced testing, and a child's adaptive behaviors in the community, for example, may have been considered.
3. A second or third opinion might be obtained by having several people participate in the assessment process including the parent.
4. Those administering the assessment devices should be knowledgeable, proficient, and qualified to administer such.
5. The assessment devices should have been tailored to the child, not the child to the procedures.
6. Any concerns or problems encountered during the evaluation process should be included in the assessment reports.
7. Evaluation decisions should have been based on the child's needs, not on administrative or program convenience.

8. Decisions regarding the child's placement should indicate that they were made with the least restrictive environment in mind.

Directions for Completing Assessment Worksheet #3

The following worksheet accompanies the EIRI Program Summary Guide and is specifically intended to be used prior to completing criterion 3 of the Services for Children Component. The worksheet is designed so that the evaluator can assess the appropriateness of children's assessment process by checking for its completeness across several items. The worksheet is completed by (1) listing the randomly sampled children's initials across the top left-handed columns, (2) rating each of the criteria on degree of implementation by placing either a "2," "1," or "0" in the appropriate box.

The results of this worksheet is then used as a basis for completing Item #2 and other related items in the Services for Children Component of the EIRI Program Summary Guide.

JUDGING THE APPROPRIATENESS OF THE ASSESSMENT PROCESS

Worksheet #3

Rate each criterion according to the following:

Rating Scale
2 = Fully Met
1 = Partially Met
0 = Not Met

Initials of Selected Children

								1. Assessment information was collected by more than one person with different specialties.
								2. The test protocols referenced in the evaluation reports should be in each child's folder.
								3. A copy of a signed Parent Consent for Evaluation form should be found in each child's folder.
								4. The evaluation report is written in synthesized format (that is, report includes all assessments in one report rather than separate reports for each assessment done)
								5. The summary evaluation report should be deemed by the evaluation team to be understandable by parents and teachers.
								6. The evaluation report should include specific programming suggestions. For example, "it is recommended that the child receive special tutoring on the following speech sounds: s, z, l. An audiometric evaluation is also recommended." A report which gives a diagnosis or classification without specific programming suggestions is not very useful.

								7. The child's folder should include medical information if necessary. Example: "Sarah has a hearing loss which is why she has not learned to speak clearly.
								8. There should be an indication that a copy of the evaluation report has been sent or verbally communicated to parents.
								9. The evaluation report should include statements about the child's strengths or particular learning style.

GROUP DESCRIPTIONS

Worksheet #4

List of Differences Between Groups

The purposes of this worksheet are to: 1) summarize your findings regarding differences between the research groups' conditions and, 2) to note any discrepancies between what the conditions should be according to the research design and what they appear to be based on the site review.

List differences between the two groups below:

Experimental or (Treatment "A")	Control or (Treatment "B")

Note any discrepancies between what the research design calls for and what was observed. (Use additional sheet if necessary).

APPENDIX III

Early Intervention Program Inventory (EIPI)

EARLY INTERVENTION PROGRAM INVENTORY

Efficient operation of an early intervention program requires an understanding of what the program is designed to do, how services are organized and delivered, what type of children and families are served, what it costs to operate the program, and what effects the program has on participating children and families. Such information can be valuable for self improvement, as well as providing useful information for other service providers (who might be looking for a particular type of program to adopt), planners and administrators (who might want to identify gaps in available services), and parents (who might want to know what options are available for their child).

The EARLY INTERVENTION PROGRAM INVENTORY contained in this booklet is designed to elicit information in the following four general areas.

Description of Program: What type of theoretical approach, instructional methods, assessment procedures, curriculum materials, etc., are used by the program?

Description of Children Served: What are the ages, functional abilities, demographic characteristics, etc., of children and families served by the program?

Program Costs: How much does the program cost to operate and how much would it cost to replicate elsewhere?

Program Benefits: What effect does the program have on participating children and families?

Each section of the booklet explains the procedures for gathering information in one of these areas. Before beginning, it is essential for you to decide:

> Is it most accurate to portray the early intervention services you provide as a single program (in which case you should complete only one set of forms);
>
> *or*
>
> Is it most accurate to portray the early intervention services you provide as two or more distinct programs (in which case you should complete a separate set of forms for each distinct program).

Deciding whether your services should be considered as a single program or multiple programs is somewhat subjective and can best be done by you as the program administrator.

The following are characteristics of a single program:

All clients in the program:

1. Receive the service(s) in a similar setting.
2. Have available to them the same (or comparable) set of services.
3. Receive the service(s) at a similar degree of intensity and duration.

The following are characteristics of multiple programs:

Some (more the 10) of the clients in the program:

1. Receive the service(s) in a setting different from other clients and/or
2. Have available to them either a greater number of services or a different set of services than other clients and/or
3. Receive the service(s) at a degree of intensity or duration (length of time each session, or frequency of sessions) which is significantly greater than that received by other clients.

The fact that early intervention services are individualized (e.g., therapy for some children focuses primarily on language, for others the primary focus is motor therapy, etc.), or that some families and children receive different services based on assessed need (e.g., only those families needing it receive home visits from a social worker) does not mean that you have multiple programs. Rather, these are variation of a single program. On the other hand, multiple programs exist when the types of services available to one group of client vary from what is available to another group of clients.

Once you have decided whether the early intervention services you provide should be considered as a single program, or multiple programs, complete items 1-3 below.

1. On the lines below, enter names or brief descriptors of the program or programs for which you will complete forms.

   Program #1: ______________________________

   ____

   Program #2: ______________________________

   ____

   Program #3: ______________________________

   ____

2. Make additional photocopies of this packet as necessary so that you have one complete set for each of the programs listed above.

3. Note that on the top of each page of the form you will find a place to insert the name of the program you are describing. This will help you remember which program you are describing as you complete the form. (This is especially important if you have multiple programs.)

4. Proceed completing the description of program form for each program listed under item 1.

PART A: DESCRIPTION OF PROGRAM

By answering the following questions, you will provide a summary description of the major elements of your program. Questions have been organized to address the major dimensions on which early intervention programs can differ. While it is understood that there are many important aspects to a program that are not addressed by these questions, those elements which are generally thought to be essential to defining different program models or approaches have been included. *

Name of Program ________________________________

SETTING OF PROGRAM

- Listed below are the different settings in which early intervention services are generally provided. Decide which service setting best describes this particular program and indicate the number of handicapped and nonhandicapped children typically enrolled in your program at any one time. (Remember, you are only completing this form for one program, therefore you will only indicate the number of children in one of the settings below.)

	# of Handicapped Children Served, On the Average	# of Nonhandicapped Children Served, On the Average
Home Based: Almost all or all services are carried out in the family's own home, even though the family may visit the center occasionally for meetings, demonstrations, etc.		
Center Based: Almost all or all services are carried out in a center (e.g., school, church, community center) even though program staff may make occasional home visits.		
Combination (home and center): A minimum of 25% of the total service is provided in each the home and the center. Home servicses may be provided by family members or staff.		
Residential: Except for holidays, weekends, and/or vacations, the child lives away from his/her family in a residential center where almost all or all services are provided.		

* Those interested in obtaining further information about the primary dimensions along with which programs or models can differ are referred to Peterson, N. L. (1987). Early intervention for handicapped children: An introduction to early childhood special education. Denver: Love Publishing; and Dunst, C. J. (1982). Theoretical bases and pragmatic considerations. In J. D. Anderson (Ed.), Curriculum for high-risk and handicapped infants. Chapel Hill, NC: TADS; on which much of the content of this section is based.

Name of Program ________________________________

INSTRUCTIONAL GROUPINGS

- Early intervention services are provided in large groups (defined here as most of the seven or more children in the classroom participating at the same time in a group activity), small groups (defined here as a subgroup of children), or one-on-one (defined here as one child and one "instructor" doing an activity). Considering the total time a "typical" child spends in your program, what is your best estimate of the percentage of time spent in each of these settings. Indicate your estimate for each type of instructional grouping (a-c) in the space provided. The sum of a+b+c should be 100%.

a. % of child's time in large groups ________
b. % of child's time in small groups ________
c. % of child's time one-on-one ________
TOTAL ____100%
(note: the sum of the entries for a, b, & c must be 100%)

- Answer the following questions if you are describing a center-based or combination center and home-based program. If your program is home based, go to the next page.

How many classrooms are a part of the program? _____

For each classroom, estimate the ratio of handicapped children:nonhandicapped children. In the left column, number your classrooms. In the right column, estimate the ratio.

Classroom	Handicapped:Nonhandicapped

Estimate the average ratio of handicapped children to nonhandicapped children in your program. _____ : _____
(handicapped) to (nonhandicapped)

Name of Program ______________________________

DURATION/INTENSITY OF SERVICES

- Although there may be some variation in the amount and frequency of services provided to children in your program, base your answers to the following questions on the "typical" or "average" handicapped child. For each question check the one most appropriate response.

a) How often is the average child scheduled to receive services from your program staff? Do not count therapy provided by parents or family members at home.

____ 1 or less times per month

____ 2 times per month

____ 3 times per month

____ 1 time per week

____ 2-3 times per week

____ 4-5 times per week

____ more than 5 times per week

b) How long does *each* service visit last for the average child? (Note that if you are describing a residential program, indicate the average number of hours per week the average child receives direct intervention as opposed to residential services.)

____ less than 1 hour

____ 1-2 hours

____ 3-4 hours

____ 4-5 hours

____ 5-6 hours

____ 6-8 hours

____ 7-8 hours

____ more than 8 hours

c) How long is the average child enrolled in your program?

____ less than 1 month

____ 1-3 months

____ 4-12 months

____ 13-24 months

____ 25-36 months

____ 37 months or more

d) Select the one answer which best approximates the average attendance (i.e., percentage of scheduled visits that are accomplished) in your program. A general approximation rather than a precise answer is what is needed.

____ 90% to 100%

____ 75% to 89%

____ 50% to 74%

____ less than 50%

Name of Program ________________________________

CURRICULUM MATERIALS

- What percentage of your instruction includes the use of a commercially-available curriculum (e.g., LAP, DISTAR, Portage, etc.)?

____ %

If your program makes substantial use of published curricula, list the three most commonly used curricula.

____

____

____

____

STAFFING

- In the space below, indicate in terms of Full Time Equivalents (FTE) the amount of each type of staff typically provided by your program (include people who provide regular services even if another agency provides the funding). For example, if you have two 1/2 time teachers and one full time teacher, you would enter 2.0 in front of teacher. Include estimates for staff shared with other programs. If you employ staff for who no titles are listed, enter a description next to "other" and estimate the amount in the same way. List staff who have dual responsibilities only once under their major position category.

FTE	Position	FTE	Position
	Teachers	____	Psychiatrists
____	noncertified	____	Nutritionists/Dieticians
____	certified	____	Physicians
____	Teachers' Aides	____	Nurses (RN or LPN)
____	Speech Therapists	____	Volunteers
____	Physical Therapists	____	University Students
____	Occupational Therapists	____	Administrative Staff
____	Adaptive P.E. Teachers	____	Clerical
____	Licensed Psychologists	____	Other (specify)
____	Behavior Therapists	____	Other (specify)

Name of Program ______________________________

TYPE OF SERVICES

- Listed below are a variety of services that might be provided as a part of an early intervention program. For each type of service make an "X" to indicate the degree to which families/children in your program receive that service directly through your program. *Note that "available on a limited basis" means that fewer services are available than would be desirable.

	Not Available Through The Program	Available Through Program Referral	Available On A Limited Basis *	Available To All Who Need The Services
a. Educational/Developmental skill development				
b. Speech therapy				
c. Physical and/or occupational therapy				
d. Adaptive physical education				
e. Routine medical/health care (e.g., immunizationa, "well" baby check-ups)				
f. Major medical (e.g., surgery, medical care for chronic illness)				
g. Music therapy				
h. Nutritional supplements or counseling				
i. Swimming				
j. Psychological services for the child				
k. Psychological services for family members				

Name of Program ______________________________

FAMILY INVOLVEMENT

- Listed below are the major alternative ways in which different early intervention programs could involve parents and family members. For each option (a through h) make an "X" to indicate aproximately what percentage of parents in your program usually become involved in each option you have available.

	Not Available In Program	Only By Referral To Other Programs	Used By 1-25% Of Parents	Used By 26-50% Of Parents	Used By 51-75% Of Parents	Used By More Than 75% Of Parents
a. **Parent Training.** Training family members to teach the child developmental skills such as feeding, language, or motor skills. Teaching may be integrated in daily activities or at separate times in the home.						
b. **Classroom Aide.** Regular participation by family member(s) (at least once a month) as aides in the classroom to assist with programming.						
c. **Group Meetings.** Parent, siblings, or father group meetings conducted by staff at least twice a year designed to provide mutual support, information, parenting skills, or a network of people in similar situations.						
d. **Resource Access.** A structured program to assist family to obtain housing, medical care, food, counseling, or other community based services that are not provided directly by the early intervention program.						
e. **Respite Care.** Weekend, evening, or vacation child care provided in addition to the regular program.						
f. **Parent-to-Parent Network.** An organized program which uses "experienced" parents to contact and provide individual support and assistance to "new" parents.						
g. **Program Governance.** Opportunities for parents to take an active role in deciding the content, organization, and staffing of the program.						
h. **Educational Planning.** Involvement of parents in developing their child's educational program.						

Name of Program ______________________________

PHILOSOPHICAL ORIENTATION

- **All early intervention programs are organized according to explicit or implicit assumptions about how children develop and learn, and how instruction/therapy can be organized and delivered most effectively. Statements representative of different philosophical orientations are listed below. Please select one of the following descriptions which most accurately describes your program (note: even if none of the descriptions are totally correct, select the one which is closest).**

___ a. Children learn best when systematic positive reinforcement follows the desired behaviors and they are praised and rewarded for their efforts. Extrinsic rewards may be necessary to support children's early learning until they reach a level of mastery that allows them to enjoy new skills for their own intrinsic reward. Criticism, verbal or physical punishment, and coercion do not encourage learning or teach desired behavior and consequently are inappropriate. Desired behavior in the child should be systematically reinforced by praise and pleasurable consequences. Antisocial or unproductive behaviors should be ignored. Teaching is done via structured, carefully sequenced lessons based on behavior and reinforcement principles and task analyses of concepts/skills that elicit frequent responses from the child.

___ b. Emphasis should be to develop children's thinking skills, as well as teach academic subject area competencies. Active experience with real objects, experimentation, exploring, and talking about experiences are more effective in teaching children than telling and showing them what to do. Classroom environment should provide an open framework that encourages each child to pursue his/her own interests and ideas through key experiences that develop his/her ability to (a) make decisions about what he/she is going to do and how to go about doing it, (b) express self in ways that communicate that experiences to others, (c) work with other children and adults so that tasks are completed through group planning and cooperative effort, (d) exercise self-discipline by identifying personal goals, by pursuing and then completing selected tasks, and (e) embrace a spirit of inquiry and openness to various points of view. The teacher's role is defined as one of facilitator and catalyst for children's learning. The teacher must create an environment wherein children will engage in active learning and where a variety of materials, resources, and objects are available.

___ c. Education should be based upon a developmental approach in that the classroom is the child's workroom, where he/she should be free to explore, discover, make choices, and seek out his/her own means for learning. A productive learning environment is one that is constantly rearranged to fit the child's changing interests and needs. The teacher's role is one of building trust, being responsive to children's needs and feelings, and sensitizing them to sights, sounds, feelings, and ideas to help build positive images of themselves as learners. Top priority is placed on children's emotional growth and stability, feelings of self worth, self expression, and self image. Activities are child-initiated and child-directed, with teachers acting in roles as interpreters of experience. Teaching is carried out on basis of child's response by elaborating upon and interpreting the experience and feelings.

Name of Program ______________________________

- Please indicate how well the description you selected above actually describes your program's philosophical orientation.

_____ very well
_____ moderately well
_____ only somewhat
_____ not well

- To what degree is the philosophical orientation indicated above actually implemented in the program?

_____ very low degree
_____ somewhat low degree
_____ to a moderate degree
_____ somewhat high degree
_____ very high degree

- **Rate your program on each of the following by placing and "X" on the line, over the number which most accurately portrays your program's philosophical orientation.**

Teacher-Directed ◄————————————► Child-Directed
1 2 3 4 5 6 7 8 9

(The degree to which the teacher determines how children spend their time, selects, and then orchestrates the tasks they undertake *versus* the degree to which children assume these responsibilities and make decisions for themselves.)

Teacher as Initiator ◄————————————► Teacher as Responder
1 2 3 4 5 6 7 8 9

(The degree to which the teacher's role is defined as one of initiating, directing, evaluating, and terminating children's activities *versus* one of following children's lead, reflecting and clarifying their experiences, and acting as an aide and resource to children.)

Children as Responders ◄————————————► Children as Initiators
1 2 3 4 5 6 7 8 9

(The degree to which children are expected to respond to tasks predefined both in content and in response mode by the teacher or by the instructional materials they use *versus* the degree to which children are free to initiate their own learning, choose from among many alternatives, and pursue their own styles of learning.)

Name of Program ______________________________

Programmed
Instructional Framework ◀——————▶ Open
Instructional Framework

1 2 3 4 5 6 7 8 9

(The degree to which instructional processes must follow a carefully planned step-by-step sequence designed to lead children to specifically defined behavioral outcomes ***versus*** the degree to which instruction is activity oriented, in which children experiment, question, explore, and thereby engage in processes out of which learning occurs.)

Extrinsic
Motivation and Reward System ◀——————▶ Intrinsic
Motivation and Reward System

1 2 3 4 5 6 7 8 9

(The degree to which external, tangible rewards [e.g., tokens, praise, edibles, privileges] are used to motivate children's learning ***versus*** the degree to which emphasis is placed on learning for the sake of learning and children's own intrinsic motivation to learn.)

High-Structured
Instructional Methodology ◀——————▶ Low-Structured
Instructional Methodology

1 2 3 4 5 6 7 8 9

(The degree to which teacher behaviors are predetermined by the model and set into prescribed roles ***versus*** the degree to which teachers are free to act on the basis of their own feelings, educational philosophy, and intuitions, provided they are congruent with the overall goals of the model.)

Didactic
Drill-Oriented ◀——————▶ Experimental
Discovery-Oriented

1 2 3 4 5 6 7 8 9

(The degree to which learning is fostered through drill and repetitious practice of specific skills ***versus*** the degree to which learning is promoted through direct experience with functional tasks that promote discovery learning and experimentation.)

Individualized Teaching ◀——————▶ Teaching to Groups

1 2 3 4 5 6 7 8 9

(The degree to which instruction is based upon an analysis of what individual children need and is delivered accordingly ***versus*** the degree to which instruction is oriented toward the needs of the group as a whole.)

PART B: DESCRIPTION OF CHILDREN

Name of Program ______________ __________________

As was indicated in the introductory instructions, a separate Description of Children form should be completed for the children in each of your programs. You should have made one copy of Part B for each program you listed on page 2. If you haven't done this, do it now.

Complete the items below:

- Estimate the approximate number (#) of children (both handicapped and nonhandicapped) in your program who are from each of the following race or ethnic origins:

_____ # White
_____ # Black
_____ # Hispanic
_____ # Asian
_____ # Native American
_____ # Other (please specify) ____________________

- Estimate the approximate number (#) of children (both handicapped and nonhandicapped) in your program who live in each of the following situations:

_____ # Both parents in the home
_____ # One parent at home
_____ # Living with relatives other than parents
_____ # Other (please specify) ____________________

- Estimate the appropriate number (#) of children (both handicapped and nonhandicapped) whose parents (the primary provider) work in the following types of positions.

_____ # White collar
_____ # Blue collar
_____ # Unskilled
_____ # Unemployed

Name of Program ______________________________

- Indicate how many children in this program have the following disabilities as their primary handicapping condition.

Type of Disability	# of Children
Autistism	________
Hearing Impaired	________
Visually Impaired	________
Speech/Language Impaired	________
Learning Disabled	________
Orthopedically Impaired	________
Behaviorally Disordered	________
Emotionally Disturbed	________
General Developmental Delay	________
Multiply Handicapped	________
Mentally Retarded	________
Other Health Impaired	________
Nonhandicapped	________

- Indicate the severity of the handicapping conditions of the handicapped children in your program by entering the approximate number of handicapped children at each level.

_____ mild _____ moderate _____ severe _____ profound

PART C: DESCRIPTION OF COSTS

COST DATA COLLECTION FORMS

Introduction

The enclosed set of forms are part of the data collection system for cost-effectiveness analysis of early intervention programs. The data collected here will cover all aspects of the cost analyses. Data on program effects will be collected separately. Your time, interest, and cooperation in this research are essential to its success and greatly appreciated.

The cost data to be collected can be divided into two categories: Personnel (teachers, consultants, administrators, etc.) and non-personnel (equipment, supplies, utilities, classroom, office buildings, etc.). In order to accurately estimate cost it is crucial that all of the resources that are used by your program are reported. That includes all contributions of goods and services to the program. If you can estimate the value of a contribution to your program, please do so, but in all cases include a description of contributions so that their value can be estimated after the forms are returned to us. An example of a difficult-to-value contribution is the time spent by parents in a parent training program or in transporting their children. The amount of parent time required by a program should be reported when it can be reasonably estimated.

Since personnel costs typically account for most of a program's total cost, we are asking for this infomation in greater detail than is required for non-personnel costs. Forms 1, 2, and 3 will provide us with a detailed description of the personnel resources required for your programs. These forms and instructions for their completion are provided on the attached blue pages. After completing the personnel costs forms, go on to the cost summary worksheet. A blank copy of the worksheet (Table 1), a completed sample worksheet (Table 2), and instructions for completing the worksheet are provided on the attached yellow pages. Indicate the total annual cost for each type of resource. Personnel costs can be summarized from the blue forms. For personnel and non-personnel resources it may be necessary to leave blank spaces for the cost of contributions (volunteers and donations). Space is provided at the end of the direction pages to describe any significant resources for which a cost is not estimated on the worksheet. We ask that you carefully follow the directions provided for completion of the forms so that your cost estimates will be consistent with those for other programs. The example in Table 2 may be used as a guide.

For non-personnel expenditures, it will be necessary to estimate this year's annual cost. Since this is not end-of-year data collection, you will not have all the required cost data yet. For example, the annual cost of utilities may have to be estimated from a previous year's data or projected from partial data for the current year. Simply indicate if figures are estimates from previous years or projections.

It is our intention that the time you spend on data collection be worthwhile. Your comments and suggestions on the process are welcome. If you have any problems or questions regarding the procedures, feel free to contact your EIRI coordinator. We appreciate the time you are spending to fill out these forms. Thank you.

Directions for computing total costs of staff salary (Form 1)

At the top of each form, fill in the name of the program. (You should have one set of forms for each program.) Fill in information for each staff member according to the following directions for each column.

A. Position
Give a discriptive title for each staff person either, full- or part-time, even if they are paid for by another program. Do not include those staff who work entirely for another program, even if they are paid for by this program. Typically, staff will include people such as:

supervisor
director
administrator
head teacher
teacher
aide
home visitor
board member
bookkeeper
speech therapist
secretary
clerk
occupational therapist
physical therapist
psychologist
nurse
bus driver
custodian
food service worker

B. FTE (Full-Time Equivalent)
Indicate the portion of Full-Time Equivalent (FTE) that each person works on this program. If time is divided between two or more programs, list the FTE allotted to only this program. A full-time person would be "1.0," a half-time person , ".5," and a person working 10 hours a week (10/40), ".25."

C. Salary or Wages: Rate
List the wages earned for the largest contractual period (e.g., hour, week, month, or year). For example, if a teacher is hired for a 10-month period, salary might be listed as **"$15,000/10 mo."** An aide paid by the hour might be listed as **"$6/1 hr."**

D. Period of Employment
List the expected length of service to your program, by month and day, for the current funding year (e.g., 1986-87). For hourly workers who are hired for the school year, time period should be from the beginning to the end of the program (e.g., 9-13-86 to 6-6-87).

E. Total Salary
List the total salry for work performed for this program over the time period indicated. This should be calculated based on FTE (column C), salary or wage rate (column D), and period of employment (column E).

F. Benefits
List the actual amount of fringe benefits for the period of employment. Include FICA, health, life, dental insurance, and retirement. List any other benefits in the "other" column. Remember that part-time employees often receive reduced or no benefits. If the staff person works part-time for this program and part-time for another program, pro-rate benefits based on FTE. If total benefits are known (e.g., 19% of salary and wages), there is no need to enter each benefit separately, enter the total in column H and leave column G blank.

G. Total Benefits
Enter directly or add the columns under G to compute total benefits for column H.

H. Total
Add columns F and H to compute total compensation (column I).

Directions for completing personnel description form (1A)

For each paid staff member, i.e., position, fill in years of experience, degree, and certifications.

Directions for computing total consultant costs (Form 2)

This form is used to indicate persons who are not on the regular staff but received compensation for services rendered (e.g., therapists, psychologists, staff trainers, etc.).

A. Type of Service
Indicate the type of service the consultant or organization performed for the program (e.g., assessment, therapy, inservice training).

B. Dates of Service
Give the month, day, and year of service or indicate when service started and ended. If service has not been completed, estimate that date of completion.

C. Number of Service Days or Hours
Indicate actual or estimated number of days or hours for which the consultant will be paid. If service included training with staff, indicate how may staff received training.

D. Compensation Rate
List the hourly or daily rate paid to the consultant for services. (May not apply to organizational contracts.)

E. Total Compensation
List the total amount of money paid to the consultant for services based on columns C and D. In some cases, it may be easier to list costs by type of service (A), giving total days or hours (C), compensation rate (D), and total compensation (E) for each type of service. You may do that if you wish.

Directions for computing total student or community member time which was donated (Form 3)

A. Type of Service
Indicate what type of service each volunteer (if any) performed for the program (e.g., teaching, assisting in classroom, clerical work, transportation for field trips, etc.).

B. Dates of Service
Give the month, day, and year of service or indicate when service started and ended. If service has not been completed, estimate the date of completion.

C. Expected Service Hours
Indicate actual or estimated number of total hours volunteers worked.

D. Leave blank.

E. Leave blank.

Directions for computing total parent time spent on the program (Form 3A)

A. Type of Service
Indicate what service each parent provided (e.g., transportation, training activities in a center or at home.). NOTE: if parents are providing transportation, mileage costs should be estimated under "transportation" (yellow forms), and time spent in driving should be described here.

B. Dates of Service
Give the month, date, and year of service, or indicate when service started and ended. If service has not been completed, estimate the day of completion.

C. Time Spent With Other Children
Indicate actual or estimated hours spent in program-related activities with children other than their own.

D. Time Spent With Own Child(ren)
Indicate actual or estimated hours spent in program-related activities with own child(ren).

E. Leave Blank

F. Leave Blank

FORM 1

STAFF SALARY

Program Name ______________________

A	B	C		D		E	F				G	H
Position	FTE	Salary	Per	Period of Employment		Total Salary	Benefits				Total Benefits	Total
				From	To		FICA	Insurance	Retirement	Other		

FORM 1A

PERSONNEL DESCRIPTION

For each staff member, please provide the following information

A	B	C	D
Position	Years of Experience	Degree	Certifications

FORM 2

CONSULTANTS

Program Name ______________________

A Type of Service	B Dates of Service	C Total Days or Service Hours	D Compensation Rate	E Total Compensation

FORM 3

VOLUNTEER STAFF

Program Name ____________________

A Type of Service	B Dates of Service	C Total Days or Service Hours	D	E

FORM 3A

PARENT VOLUNTEERS

Program Name ____________________

A Type of Service	B Dates of Service	C Time with Own Children	D Other Time	E	F

Directions for completing the Cost Summary Worksheet (Table 1)

Table 1 provides a blank worksheet to be completed which describes all the resources used by your program. You may wish to make a copy of the worksheet for working through the costs. A completed example of this worksheet is provided on Table 2. The columns indicate various sources which bear the costs of the resources. The sponsor of your program, for example, may be a school district. A column is provided for state, local, or federal agencies which may provide resources to your program. There are columns also for private contributions and any other sources which provide resources. The following section explains the procedures for calculating the total cost of each resource except those which are contibuted, which we are asking you to keep track of separately.

Personnel

The computation of the total cost of personnel (salaried staff and consultants) is straightforward if the figures on the blue cost forms accurately represent the quantity of personnel resources consumed (i.e., salaries and benefits have been pro-rated according to FTEs). Simply sum the "total" columns and allocate costs on Table 1B in the appropriate categories. Leave volunteers blank.

Capital Assets

Facilities, vehicles, and equipment are capital assets which the program uses on a long-term basis (more than one year). Their costs need to be apportioned to the relevant time period (e.g., 1986-87 school year). If any capital assets are rented, simply use the annual rental cost. If the item is not rented, you may either estimate its annual rental value or you may apply an annualization factor as explained below. Use Tables 3.1, 3.2, and 3.3 to describe your program's capital assets and value then using either estimated rental values or the annualization factor.

Facilities: Use Table 3.1 to describe the space used by your program. Be sure to include the age of the building and approximate square footage. Determine the replacement cost of the space and multiply by .1175, which is the annualization factor (or estimate the annual rental value). Enter total annual cost on worksheet.

Vehicles: Use Table 3.2 to describe any vehicles used by the program. Describe the vehicle (make, model, mileage). Determine its replacement cost and multiply by the annualization factor, .2638, or estimate the annual rental value. Enter total annual cost on worksheet.

Equipment: Use Table 3.3 to describe the equipment used by your program. This includes office and classroom furniture, computers, typewriters, toys, etc. You need list here only the major equipment valued at greater than $2,500. To determine the cost of equipment, make an inventory list of equipment valued at less than $2,500 on a separate sheet of paper. Determine each item's replacement cost. Add up all the replacement costs and multiply by the annualization factor, .2638, or estimate annual rental values. Enter this figure on Table 3.3. Repeat this process for equipment valued at greater than $2,500 on Table 3.3. Add the two costs together and indicate the total costs of equipment on the worksheet. NOTE: For capital assets which are contributed to your program, please make a list under "private contributions" (p. 14).

Transportation

Staff transportation includes job-related travel, such as home visits, travel between centers, any air travel, and consultant travel, and consultant travel paid for by the program. Indicate the total annual cost on the worksheet.

Child transportation may, or may not, be provided by the program. If program provided, indicate its annual cost on the worksheet. If parent or car pool provided, costs need to be estimated based upon round-trip mileage, cost per trip, and the number of trips per year. Calculate total costs by mutiplying cost per trip by the number of trips per year. Assume a vehicle cost of $.21 per mile. NOTE: If parents or volunteers are providing transportation, mileage costs should be estimated here, and their time spent in driving be described on Forms 3 and 3A.

Materials and Supplies

Estimate based upon last year's cost or project the program's total annual expenditure on materials and supplies (paper, pens, pencils, typewriter ribbon, custodial supplies) and enter on worksheet (indicate at the bottom of Table 1 whether figure is an estimate or a projection).

Utilities

Indicate the total cost for all utilities, based upon last year's cost data or a projection (and indicate which methods was used). If some, or all, utility costs are included in direct or occupancy charges, indicate that and do not re-enter the costs here.

Insurance

Estimate or project total annual expenditures on all insurance costs associated with program operation. Includes vehicle, building, etc. (Again, if included elsewhere, indicate and do not double count here.)

Miscellaneous

Indicate on worksheet any costs associated with the program which are not included elsewhere (e.g., debt service, magazine subscriptions, field trip expenses, etc.).

Private Contributions

Unless you have estimates for the value of contributions, it may be necessary to leave the last column on the cost summary worksheet blank. We will estimate costs for this column after you return the forms. To enable us to do this, it is important that you describe here any in-kind contributions to your program. You can indicate the estimated value, if you have some basis for doing so:

Item Description	Estimated Value

Total Program Cost

For most programs, it will not be possible to write in estimates of total program cost because the value of some contributed resources remains to be estimated after the forms are returned to us. If your program does not utilize and contributed resources, you may add up the cost of all resources. Please report the number of children served with the resources reported on this worksheet. For some programs, that may include children who are not part of the research study.

Client Fees

Indicate on the worksheet the total annual value of fees charged to parents or guardians (if any).

Table 1

Cost Summary Worksheet

Resources	Paid by Sponsor	Paid by Agencies	Private Contributions (Donations)	Other
Personnel				
Salaried Staff				
Consultants				
Volunteers				
Parent/Volunteers				
Capital Assets				
Facilities				
Buildings				
Land				
Capital improvements				
Vehicles				
Equipment				
Transportation				
Staff				
Children				
Material/Supplies*				
Utilities*				
Insurance*				
Miscellaneous				
Total Cost				
*Number of children				
Client Fees				

*These costs were computed according to (indicate resource on blank line):

Projection ______________

Last year's cost ______________

Other ______________

Table 2

Cost Summary Worksheet (example)

Resources	Paid by Sponsor	Paid by Agencies	Private Contributions (Donations)	Other
Personnel				
Salaried Staff	$144,753			
Consultants	10,000	$6,193		
Volunteers			$33,562	
Parent/Volunteers				
Capital Assets				
Facilities				
Buildings	2,000		8,000	
Land			272	
Capital improvements				
Vehicles	4,353			
Equipment			4,030	
Transportation			5,000	
Staff	9,036			
Children	4,373			
Material/Supplies*	3,000			
Utilities*	3,250			
Insurance*	1,200			
Miscellaneous	1,500	—	—	
Total Cost	$183,465	$6,193	$50,864	
***Number of children** 40				
Client Fees				

*These costs were computed according to (indicate resource on blank line):

Projection — Materials and supplies

Last year's cost — Utilities, insurance

Other — ____________

Table 3.1

Facilities

Description of buildings and land used by the program (include age of building)	Square footage used by the program	Replacement Cost	Rental Value

TOTAL COST __________

X Annualization Factor .1175

= Annual Facilities Cost __________

Table 3.2

Vehicles

Vehicle Description (make, model, mileage)	Replacement Cost	Rental Value

TOTAL COST ____________

X Annualization Factor .2638

= Annual Vehicle Cost ____________

Table 3.3

Equipment

A. Annualized cost of equipment valued at less than $2,500: ____________

B. Inventory list of equipment valued at greater than $2,500:

Description	Replacement Cost	Rental Value

C. Total Cost of all equipment with a value greater than $2,500 ____________
X Annualization Factor .2638
= Annual cost of equipment ≥ $2,000 ____________

D. Total annual cost of equipment (A + C): ____________
(Enter this figure on worksheet)

PART D: DESCRIPTION OF EFFECTS

Name of Program ______________________________

In order to complete Part D, the Battelle Developmental Inventory should have been completed for each child in your program.

Complete the Child Description Recording Form by entering the appropriate information from the Score Summary found on the next page of the Battelle Screening Test scoring booklet for each child in this program.

- Enter the appropriate name of the program in the blank at the top of the form.
- Enter each client's name and chronological age (in months) at time of testings.
- Enter each age equivalent score for each of the respective Battelle domains; personal-social, adaptive, motor, communication, cognitive, and total.
- Enter the appropriate ratings on sight and hearing using the following criteria.

Sight

1 = Normal
2 = Suspected visual impairment
3 = Documented mild visual impairment
4 = Documented moderate visual impairment
5 = Documented sever visual impairment
6 = Documented profound visual impairment

Hearing

1 = Normal
2 = Suspected hearing impairment
3 = Documented mild hearing impairment
4 = Documented moderate hearing impairment
5 = Documented sever hearing impairment
6 = Documented profound hearing impairment

Name of Program ______________________________

CHILD DESCRIPTION RECORDING FORM

Student #	Chrono. Age at Testing	Personal-Social Age Equiv.	Adaptive Age Equiv.	Motor Age Equiv.	Commun. Age Equiv.	Cognitive Age Equiv.	Total Age Equiv.	Sight	Hearing

APPENDIX IV

Abilities Model

Child's Birthday __ __/__ __/__ __ (18-23)
M M D D Y Y

Date Completed __ __/__ __/__ __ (24-29)
M M D D Y Y

Child's major handicapping condition(s) &/or risk factors

________________________________ (30-37)

Source for the above classification (e.g., staff judgement, medical records, educational/psychological evaluation, etc.)

________________________________ (38-41)

THE ABILITIES MODEL

(Simeonsson & Bailey, 1984)

INSTRUCTIONS: The table provides a means to define the child's status in 9 major areas. For each column, place an "X" in the space that best describes the child.
PLEASE NOTE: You need to make four (4) X's under limbs and two (2) each under Extremity-Leg and Sight.

For FPG Use Only

Card number __ __ (1-2)

For Program Use - Please complete

Project ID __ __ (3-4)
Child ID __ __ __ __ __ (5-9)
Interviewer ID __ __ (10-11)
Collection Period __ (12)
Individual Period __ (13)

Level	A	B	I	L				I	T		I	E		S	
	Audition	Behavior	Intelligence	Limbs				Intentional Communication	Tonicity		Integrity of Physical Status	Extremity - Leg		Sight	
				Left		Right			Hyper-	Hypo-		Rt	Lt	Rt	Lt
				Arm	Hand	Arm	Hand								
1	Normal	Normal	Normal within expected rate of development for age	Complete normal use	Complete normal use	Complete normal use	Complete normal use	Intentional communication adequate for age even if communication is non-verbal (e.g., signing, bliss symbols, etc.)	Normal	Normal	Overall good health	Complete normal use	Complete normal use	Normal	Normal
2	Suspected hearing impairment	Occasional expressions of unusual behavior	Slow (Borderline) 3/4 rate of expected development for age	Some involvement but functional	Some involvement but functional	Some involvement but functional	Some involvement but functional	Intentional communication less than adequate for age but generally functional even if it is non-verbal	Variable but mostly normal	Variable but mostly normal	Variable, more than normal health problems	Some involvement but functional	Some involvement but functional	Suspected visual impairment	Suspected visual impairment
3	Documented mild hearing impairment	Occasional expressions of asocial/atypical behavior	Mild delay 2/3 rate of expected development for age	Usable with minimal support	Usable with minimal support	Usable with minimal support	Usable with minimal support	Limited use of idiosyncratic gestures/vocalizations	Mild Degree	Mild Degree	Chronic but minor health problems	Usable with minimal support	Usable with minimal support	Documented mild visual impairment	Documented mild visual impairment
4	Documented moderate hearing impairment	Frequent expressions of asocial/atypical behavior	Moderate delay 1/2 rate of expected development for age	Usable with some support	Usable with some support	Usable with some support	Usable with some support	Ability to communicate very limited and/or setting specific	Mod. Degree	Mod. Degree	Chronic, controlled health problems	Usable with some support	Usable with some support	Documented moderate impairment	Documented moderate impairment
5	Documented severe hearing impairment	Frequent expressions of bizarre/atypical behavior	Severe delay 1/3 rate of expected development for age	Usable only with external support	Usable only with external support	Usable only with external support	Usable only with external support	Only occasional evidence of some form of communication: primitive and basic in nature	Severe Degree	Severe Degree	Chronic, uncontrolled health problems	Usable only with external support	Usable only with external support	Documented severe impairment	Documented severe impairment
6	Documented profound hearing impairment; Deaf	Constant expressions of bizarre, atypical, out of control behavior	Profound delay 1/4 rate of expected development for age	Useless	Useless	Useless	Useless	No evidence of any form of intentional communication	Totally Rigid	Totally Rigid	Total incapacitation due to chronic health problems	Useless	Useless	Documented profound visual impairment; Blind	Documented profound visual impairment; Blind
	__ (42)	__	__	__	__	__	__	__ (49)	__	__	__	__	__	__	__ (56)

APPENDIX V

Materials Related to Onsite Evaluations

The following matrix indicates the types of items included in the most frequently used program evaluation guides for early childhood special education programs. The column labeled EIRI indicates the items included in the EIRI guide for conducting onsite evaluations. Other columns indicate items contained in other widely used guides (TADS indicates those in the TADS Manual for Comprehensive Program Review: UDE indicates the Early Childhood special Education Program Evaluation Guide developed by the Virginia Department of Education; and NAEYC indicates the Accrediation Criteria dn Procedures of the National Association of the Education of Young Children.

Child

	EIRI	TADS	VDE	NAEYC
1. System has specific procedures for Child Find.		X	X	
2. System has identified person(s) responsible for Child Find			X	
3. System has specific procedures for screening.		X	X	
4. System has procedures for determining eligibility which include:		X	X	
5. Multidisciplinary assessment procedures consistent with state and federal regulations (e.g., medical, psychological, socio-cultural, developmental, and educational where appropriate).	X	X	X	
6. Program has procedures for developing IEP's which include:	X	X	X	
7. Program has curriculum that is consistent with the program philosophy of service.	X		X	
8. Program has materials and equipment necessary to implement the objectives stated in the student's IEP.	X		X	
9. Program collects student progress data.	X	X	X	
10. Program uses student progress data in modification of short-term goals and objectives.	X	X	X	
11. The program provides or obtains all related services indicated in the IEP's:		X	X	
12. Program has procedures for transition of students from preschool program to other educational settings at preschool or elementary level.	X	X	X	
13. Staff interact frequently and positively with children. Staff express respect for and affection toward children by smiling, touching, holding, as well as talking and communicating with individual children during daily routines.	X			X
14. Staff talk with individual children and encourage children of all ages to use language as appropriate.	X			X
15. Functional skills and functional skill training routines are included in the curriculum.	X			
16. Staff treat child of all races, religions, and cultures equally with respect and consideration.	X			X
17. Staff provide children of both sexes with equal opportunities to take part in all activities.	X			X

18.	Staff encourage developmentally appropriate independence in children. Staff foster independence in routine activities such as picking up toys, wiping spills, personal grooming, obtaining and caring for materials and other self-help skills.	X			X
19.	Staff use positive techniques of guidance including redirection, anticipation of an elimination of potential problems, positive reinforcement, and encouragement rather than competition, comparison, or criticism.	X			X
20.	Staff do not use physical punishment or other negative discipline methods that hurt, frighten, or humiliate children.	X			X
21.	Staff encourage prosocial behaviors in children such as cooperating, helping, taking turns, talking to solve problems. Adults both model these desired behaviors as well as praise appropriate prosocial behaviors.	X			X
22.	Staff expectations of children's social behavior are developmentally appropriate.	X			X
23.	Lesson plans are consistent with IEP goals and objectives for each child and data collection procedures for instructional decision making have been implemented.	X		X	
24.	Appropriate instruments for assessing child progress have been selected for use.	X		X	
25.	The skill sequences in the curriculum include the skills needed by children in the project.	X		X	
26.	Staff plan realistic curriculum goals for children based on assessment of individual needs, interests and parent's input.	X		X	
27.	The skill sequences in the curriculum extend beyond the children's current level of functioning.	X			
28.	The step sizes between objectives in the skill sequences are sufficiently small.	X			
29.	Teaching activities are present for skill sequences.	X			
30.	Descriptions of teaching activities are sufficient to allow for implementation.	X			
31.	Staff plan realistic curriculum goals for children based on assessment of individual needs, interests and parent's input.	X	X	X	
32.	Functional skills and functional skill training routines are included in the curriculum to the degree appropriate.	X			
33.	Curriculum skill sequences are appropriate for or adaptable for physically handicapped and sensorially impaired children.	X			
34.	The curriculum's record keeping system is being used to periodically record child performance.	X			

Facilities

	EIRI	TADS	VDE	NAEYC
1. The space allocated is appropriate for the number of children served.	X	X	X	X
2. The facility provides space for individual as well as group instruction.	X	X	X	X
3. A variety of age appropriate materials and equipment are available for children indoors and outdoors.	X		X	X
4. The environment includes soft elements such as rugs, cushions, or rocking chairs.	X			X
5. The outdoor play area is protected from access to streets and other dangers.	X			X
6. The indoor and outdoor environments are safe, clean, attractive and spacious.	X			

Parents

	EIRI	TADS	VDE	NAEYC
1. The project has a written statement of the philosophy for parent and family involvement with the project.		X	X	
2. The project has a written statement of goals and objectives for the Services for Parents Component.		X	X	
The project has a written statement of and/or clearly delineated plans and procedures for ...				
3. ... orienting parents and other family members to the project.		X	X	
4. ... determining the needs of parents that can be addressed by the project.		X	X	
5. ... providing direct project services for parents.		X	X	
6. ... providing types of parent involvement other than receiving direct services.		X	X	
7. ... identifying needs and acquiring services for parents from other agencies.		X	X	
8. ... providing information and involvement for parents as required in PL 94-142 and HCEEP guidelines.		X	X	
9. ... assigning staff responsibilities within the Services for Parents Component		X		
10. ... maintaining records on the activities of the Services for Parents Component.		X		

Administration

	EIRI	TADS	VDE	NAEYC
1. Program has a statement of philosophy which includes an outline of program objectives.	X	X	X	
2. The program has procedures for involving parents and teachers in the policy decision-making process.			X	
3. The program provides for regular staff meetings.			X	
4. Student records are maintained appropriately. There is a specified location for each student's cumulative and confidential records.			X	
5. Program has designated an individual as primarily responsible for program evaluation.		X	X	
6. The program uses objective criteria in evaluation of staff performances.		X	X	
7. The program has procedures for feedback between supervisor(s) and staff.			X	
8. The program has procedures for assessing staff development needs.		X	X	
9. Program has a staff development record keeping system, which is used in program evaluation.		X	X	
10. The project has a written statement of procedures for informed consent, due process, and assurance of confidentiality.	X		X	
11. The project staff has a written statement of job descriptions and qualifications for all project staff.	X			
12. Regular program review and planning activities are being carried out as established.	X			
13. Regular personnel evaluations are being carried out as planned.	X			